

Tectonic Hazard Examples

Hazard	Key facts	Causes	Effects		Responses	
			Primary	Secondary	Short-term	Long-term
Northridge earthquake, Los Angeles, USA	<ul style="list-style-type: none"> 17 January 1994 4.31am 6.7M Richter scale Lasted 10-20sec 	<ul style="list-style-type: none"> Blind fault line previously undiscovered (not San Andreas Fault) 	<ul style="list-style-type: none"> 57 people killed 9000 injured 9 bridges collapsed 11 major roads damaged 	<ul style="list-style-type: none"> Cost \$15bn 		
Sichuan earthquake, China	<ul style="list-style-type: none"> 12 May 2008 2.28pm 8.0M Richter scale 	<ul style="list-style-type: none"> Longmenshan Fault 	<ul style="list-style-type: none"> 69,195 people killed 18,392 missing 7,000 school buildings destroyed (Gov. heavily criticised for poor construction) Significant agriculture loss 	<ul style="list-style-type: none"> \$135bn economic cost 4.8 million homeless Oil prices drop as Chinese demand drops after earthquake 	<ul style="list-style-type: none"> Premier Wen Jiabo visited within hours. Chinese soldiers sent in for relief effort Search and Rescue teams Distribution on Supplies Rehousing victims International aid 	<ul style="list-style-type: none"> Restoring houses Planning appropriate disaster relief An increase in the quality of building in China 'School building reinforcement project'
Izmit earthquake, Turkey	<ul style="list-style-type: none"> 17th August 1999 7.4M Richter scale Epicentre close to industrial centre of Izmit 	<ul style="list-style-type: none"> East Anatolian Fault 	<ul style="list-style-type: none"> 14,000 dead 200,000 homeless 80% buildings destroyed (65,000) Tupras refinery set ablaze by fire 	<ul style="list-style-type: none"> Tens of thousands had to live in temporary shelter Air pollution from refinery fire causing health problems 	<ul style="list-style-type: none"> Aid channelled through NGOs and the Red Crescent The American Red Cross established a 24 hour record for online disaster relief donation through its internet In total, rescue teams from twelve countries assisted in the rescue effort The U.K announced an immediate grant of £50,000 to help the Turkish Red Crescent, while the International Red Cross and Red Crescent pledged £4.5 million to help victims. Blankets, medical supplies and food were flown from Stansted airport. Engineers from Thames Water went to help restore water supplies. India also assisted by providing 32,000 tents and 2 million rupees to help in the reconstruction process 	
Bhuj earthquake, India	<ul style="list-style-type: none"> 26 January 2001 7.9M Richter scale Tremors lasted for 1 minute Occurred on a national holiday 		<ul style="list-style-type: none"> Between 30,000 and 100,000 people died Many buildings collapsed due to poor construction Hospitals, fire stations and civil administration buildings were all destroyed 	<ul style="list-style-type: none"> Poor sanitation and lack of drinking water led to the spread of disease such as cholera and typhoid Psychological trauma Up to 500,000 homeless 	<ul style="list-style-type: none"> Very limited medical facilities Rescue operation was unable to start for nearly three days in some areas 	
Asian tsunami	<ul style="list-style-type: none"> 26 December 2004 9.0M Global disaster 	<ul style="list-style-type: none"> Destructive plate boundary Indian (oceanic) and Eurasian (continental) plates 	<ul style="list-style-type: none"> Main impact on western tip of the Indonesian island of Sumatra 70% inhabitants of some coastal villages died 1/3 population in Banda Aceh died Over 110,000 people died in total 127,000 still missing Buildings destroyed Over 31,000 died in Sri Lanka Crops and fishing boats destroyed 	<ul style="list-style-type: none"> Up to 800,000 homeless in Indonesia Between 800,000 and 1 million homeless in Sri Lanka Indonesian Gov estimated reconstruction would cost \$4.5bn 	<ul style="list-style-type: none"> Aid agencies provided emergency food, water and shelter to about 330,000 people 	<ul style="list-style-type: none">

Kashmir earthquake, Pakistan	<ul style="list-style-type: none"> 8 October 2005 8.52am 7.7M Richter scale Over 22 aftershocks (one measured 6.2M) 	<ul style="list-style-type: none"> Collision margin Indo-Australian, Iranian and Eurasian plates 	<ul style="list-style-type: none"> Death toll = 73,000 Muzaffarabad 1442 schools collapsed (12,000 students & teachers died) 69,000 seriously injured Water & sanitation systems broken 	<ul style="list-style-type: none"> 3 million homeless Nearly 1 million homeless had to sleep out in the open Disease broken out 	<ul style="list-style-type: none"> International aid was chaotic and underfunded UN received only 12% funds pledged Tents erected as temporary housing Shortage of tents available to withstand Kashmir winter as well as blankets, sleeping bags, warm clothes, medicine and food Food only given to those who were easily accessible 	<ul style="list-style-type: none"> Schools and hospitals rebuilt Building regulations improved to reduce damage and the death rate in future earthquakes
Kobe earthquake, Japan	<ul style="list-style-type: none"> 17 January 1995 5.46am (less deaths because not rush hour) 7.2M Richter scale 	<ul style="list-style-type: none"> Destructive plate boundary Pacific oceanic subducting under Eurasian continental plate (at a rate of up to 10cm per year) 	<ul style="list-style-type: none"> Killed over 5000 people (most of those who died were over 60yrs mostly as a result of suffocation or being crushed because they were less able to escape quickly) Over 30,000 injured Important public facilities collapsed 80% schools, museums, sports facilities and sake breweries were severely damaged Over 67,000 homes completely destroyed and 55,000 partially destroyed out of a total of 472,160 	<ul style="list-style-type: none"> Almost 1/3 million homeless Rain, strong winds and lightning increased the risk of landslides Broken gas supplies led to fires (175). Took three months to restore gas supply. Damaged water supplies and disrupted for three months afterwards People forced to live in damp, unhygienic conditions which led to disease Aftershocks caused further damaged to buildings Power cuts across whole city Waste disposal disrupted for over a month Economic cost approx. £80bn Many manufacturers bankrupt 	<ul style="list-style-type: none"> Evacuation Temporary shelter Emergency rations Rescue teams searched for survivors for 10 days 	<ul style="list-style-type: none"> Many moved away from area permanently Jobs created in the construction industry
Soufriere Hills volcano, Montserrat, Caribbean	<ul style="list-style-type: none"> July 1995 Ongoing eruption (erupting on and off for over a decade) predicted 	<ul style="list-style-type: none"> Destructive plate boundary Caribbean (continental) and Atlantic (oceanic) plate 	<ul style="list-style-type: none"> Rock bombs Lava flows Gases esp sulphuric acid Ash and dust Pyroclastic flows Destroyed airport 19 deaths (all farmers) 	<ul style="list-style-type: none"> Mudflows (lahars) Contaminated water Fires Landslides Earthquakes Disease Crop failure 60% of southern and central parts of the island uninhabitable Many islanders suffer from silicosis and asthma Continued volcanic activity threatens island's economic development 	<ul style="list-style-type: none"> Plymouth evacuated in 1995 and 1996 Southern part of the island abandoned Unemployment due to collapse of tourist industry 	<ul style="list-style-type: none"> People of Montserrat granted full residency rights in the UK if they wanted to migrate Full British citizenship in 2002 Exclusion zone in southern part of the island Plymouth abandoned as capital Redevelopment of the northern part of the island UK launched three year \$122 million aid programme to help reconstruct economy EU agreed £6.5million grant to relocate capital Montserrat Volcano Observatory set up
Mt St Helens, USA	<ul style="list-style-type: none"> 18 May 1980 8.32am Rural area Predicted 	<ul style="list-style-type: none"> Destructive plate boundary Juan de Fuca (oceanic) and North American (continental) plate 	<ul style="list-style-type: none"> Nuée ardentes (hot ash and gas) destroyed forest and logging camps 62 people killed mainly by poisonous gases (predicted so locals and tourists evacuated) Lahars covered an extensive area surrounding the volcano Created deposits of ash up to 50m thick 	<ul style="list-style-type: none"> Ash blocked rivers destroying popular fishing sites and causing flooding Destroyed crops and livestock Flooding destroyed communications such as road and railway bridges 	<ul style="list-style-type: none"> Communications repaired People rehoused 	<ul style="list-style-type: none"> Soil fertility improved due to ash deposits Volcano more carefully monitored Tourism increased, boosting local economy

Eldfell, Heimaey, Iceland	<ul style="list-style-type: none"> January 1973 Well managed 	<ul style="list-style-type: none"> Constructive plate boundary Mid Atlantic Ridge 	<ul style="list-style-type: none"> Ash Destroyed homes 		<ul style="list-style-type: none"> Nearly all 5300 residents evacuated overnight Lava sprayed with cold seawater slowing its flow and solidifying in (saved town and fishing port) 	<ul style="list-style-type: none"> Diverted lava flows created new land, 200 new homes built here
Nyiragongo, Goma, Dem Rep of Congo	<ul style="list-style-type: none"> January 2002 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 45 deaths Airport cut off Farmland relatively unaffected Lava destroyed over 40% city (more than 4500 buildings and homes) 	<ul style="list-style-type: none"> About 500,000 homeless 	<ul style="list-style-type: none"> Human and physical geography of the region made management difficult Some refugees initially went to Kigali, Rwanda but many thought it was safer to stay in Congo rather than risk their safety in Rwanda More difficult to evacuate people as Goma was on the shores of Lake Kivu 	<ul style="list-style-type: none"> Monitoring volcano carefully for signs of future eruptions
Mt Pinatubo, Philippines	<ul style="list-style-type: none"> 9 June 1991 started to erupt Climactic eruption on 15 June 1991 1460m volcano which had been dormant for almost 600 years 2nd largest eruption of 20th century 	<ul style="list-style-type: none"> Destructive plate boundary Eurasian (continental) plate and Philippine (oceanic) plate 	<ul style="list-style-type: none"> Rock and ash scattered over 100km radius Triggered a series of earth tremors measuring up to 5.4M Richter scale Nearly 350 killed (mainly due to buildings collapsing from weight of rain-soaked ash) Six people died in the few first days Mud storms and mudslides covered 50,000 ha of cropland 	<ul style="list-style-type: none"> Over 200,000 homeless Typhoon hit on 15-16 June making impacts much worse as rain combined with ash collapsing buildings Crops destroyed Over 200,000 homes destroyed Electricity supply cut for 3 weeks Water contaminated and gastric disease broke out Roads and telecommunication links destroyed Respiratory disease broke out 600,000 lost their jobs Impacted global climate 	<ul style="list-style-type: none"> Over 200,000 people evacuated saving many lives as a result of the early warning system (USGS) By 22 June, 35,000 US service personnel and their families evacuated to USA Temporary housing provided 	<ul style="list-style-type: none"> Long term aid from Red Cross and USA