DOWNLOAD PDF MODIFIED MERCALLI INTENSITY SCALE

Chapter 1 : Mercalli intensity scale - Simple English Wikipedia, the free encyclopedia

The Modified Mercalli Intensity Scale The effect of an earthquake on the Earth's surface is called the intensity. The intensity scale consists of a series of certain key responses such as people awakening, movement of furniture, damage to chimneys, and finally - total destruction.

Modified Mercalli Intensity Scale of Bulletin of the Seismological Society of America, 21, The Modified Mercalli scale is designed to describe the effects of an earthquake, at a given place, on natural features, on industrial installations and on human beings. The intensity differs from the magnitude which is related to the energy released by an earthquake. There are multiple versions of the MM scale, the one listed here being the version. Not felt - or, except rarely under especially favourable circumstances. Under certain conditions, at and outside the boundary of the area which a great shock is felt: Felt indoors by few, especially on upper floors, or by sensitive, or nervous persons. Also, as in grade I, but often more noticeably: Felt indoors by several, motion usually rapid vibration. Sometimes not recognized to be an earthquake at first, duration estimated in some cases. Vibration like that due to passing of light, or lightly loaded trucks, or heavy trucks some distance away. Hanging objects may swing slightly. Movement may be appreciable on upper levels of tall structures. Rocked standing motor cars slightly. Felt indoors by many, outdoors by few. Awakened few, especially light sleepers. Frightened no one, unless apprehensive from previous experience. Vibration like that due to passing of heavy, or heavily loaded trucks. Sensation like heavy body striking building, or falling of heavy objects to inside. Rattling of dishes, windows, doors; glassware and crockery clink and clash. Creaking of walls, frame, especially in the upper range of this grade. Hanging objects swing, in numerous instances. Disturbed liquids in open vessels slightly. Felt indoors by practically all, outdoors by many or most. Awakened many, or most. Frightened few - slight excitement, a few ran outdoors. Broke dishes, glassware, to some extent. Cracked windows - in some cases, but not generally. Overturned small or unstable objects, in many instances, with occasional fall. Hanging objects, doors, swing generally or considerably. Knocked pictures against walls, or swung them out of place. Opened or closed, doors, shutters, abruptly. Pendulum clocks stopped, started, or ran fast, or slow. Moved small objects, furnishings, the latter to slight extent. Spilled liquids in small amounts from well-filled open containers. Trees, bushes, shaken slightly. Felt by all, indoors and outdoors. Frightened many, excitement general, some alarm, many ran outdoors. Persons made to move unsteadily. Trees, bushes, shaken slightly to moderately. Liquid set in strong motion. Small bells rang -church, chapel, school etc. Damage slight in poorly built buildings. Fall of plaster in small amount. Cracked plaster somewhat, especially fine cracks chimneys in some instances. Broke dishes, glassware, in considerable quantity, also some windows. Fall of knick-knacks, books, pictures. Overturned furniture, in many instances. Moved furnishings of moderately heavy kind. Frightened all - general alarm, all ran outdoors. Some, or many, found it difficult to stand. Noticed by persons driving motor cars. Trees and bushes shaken moderately to strongly. Waves on ponds, lakes, and running water. Water turbid from mud stirred up. Incaving to some extent of sand or gravel stream banks. Rang large church bells, etc. Suspended objects made to quiver. Damage negligible in buildings of good design and construction, slight to moderate in well-build ordinary buildings, considerable in poorly build or badly designed buildings, abode houses, old walls especially where laid up without mortar , spires, etc. Cracked chimneys to considerable extent, walls to some extent. Fall of plaster in considerable to large amount, also some stucco. Broke numerous windows, furniture to some extent. Shook down loosened brickwork and tiles. Broke weak chimneys at the roof-line sometimes damaging roof. Fall of cornices from towers and high buildings. Dislodged bricks and stones. Overturned heavy furniture, with damage from breaking. Damage considerable to concrete irrigation ditches. Fright general - alarm approaches panic. Disturbed persons driving motor cars. Trees shaken strongly - branches, trunks, broken off, especially palm trees. Ejected sand and mud in small amounts. Damage slight in structures brick built especially to withstand earthquakes. Considerable in ordinary substantial buildings, partial collapse: Cracked, broke, solid stone walls seriously. Wet ground to some extent, also ground on steep slopes. Twisting, fall, of chimneys, columns, monuments, also factory stack, towers. Moved conspicuously, overturned, very heavy furniture. Damage considerable in masonry structure build especially to withstand earthquakes: Cracked ground, especially when loose and wet, up to widths of several inches; fissures up to a yard in width ran parallel to canal and stream banks. Landslides considerable from river banks and steep coasts. Shifted sand and mud horizontally on beaches and flat land. Changed level of water in wells. Threw water on banks of canals, lakes, rivers, etc. Damage serious to dams, dikes, embankments. Severe to well-build wooden structures and bridges, some destroyed. Developed dangerous cracks in excellent brick walls. Destroyed most masonry and frame structures, also their foundations. Bent railroad rails slightly. Tore apart, or crushed endwise, pipe lines buried in earth. Open cracks and broad wavy folds in cement pavements and asphalt road surfaces. Disturbances in ground many and widespread, varying with ground material. Broad fissures, earth slumps, and land slips in soft, wet ground. Ejected water in large amounts charged with sand and mud. Caused sea-waves "tidal" waves of significant magnitude. Damage severe to wood-frame structures, especially near shock centers. Great to dams, dikes, embankments, often for long distances. Few, if any masonry , structures remained standing.

Chapter 2 : Mercalli intensity scale - WikiVisually

The Mercalli intensity scale is a seismic intensity scale used for measuring the intensity of an earthquake. It measures the effects of an earthquake. It is distinct from the moment magnitude (M w) usually reported for an earthquake, which is a measure of the energy released (sometimes misreported as the Richter magnitude, M L).

Earthquake Intensity Of the two ways to measure earthquake size, magnitude based on instrumental readings and intensity based on qualitative effects of earthquakes, only intensity can be applied to pre-instrumental earthquakes. The methodology is simple. At each location assign a numeral to describe the earthquake effect Contour the zones of similar effect The earthquake is assumed to have occurred near the region of maximum intensity The earthquake may be characterized by the largest Roman numeral assigned to it The problems with intensity are multifold. First, it is a qualitative assessment that measures different phenomena. The lower values address human response to ground motions, the intermediate values characterize the response of simple structures, and the upper values describe ground failure processes. Another problem is that incomplete spatial coverage may lead to a mislocation of the earthquake or an underassessment of its size. This is easily visualized for offshore earthquakes or, in the case of the United States, inadequate population distribution at the time of the earthquake. Not felt except by a very few under especially favorable circumstances. I Rossi-Forel scale II. Felt only by a few persons at rest, especially on upper floors of buildings. Delicately suspended objects may swing. Felt quite noticeably indoors, especially on upper floors of buildings, but many people do not recognize it as an earthquake. Standing automobiles may rock slightly. Vibration like passing of truck. During the day felt indoors by many, outdoors by few. At night some awakened. Dishes, windows, doors disturbed; walls make creaking sound. Sensation like heavy truck striking building. Standing automobiles rocked noticeably. IV to V Rossi-Forel scale 0. Felt by nearly everyone, many awakened. Some dishes, windows, and so on broken; cracked plaster in a few places; unstable objects overturned. Disturbances of trees, poles, and other tall objects sometimes noticed. Pendulum clocks may stop. V to VI Rossi-Forel scale 0. Felt by all, many frightened and run outdoors. Some heavy furniture moved; a few instances of fallen plaster and damaged chimneys. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable in poorly built or badly designed structures; some chimneys broken. Noticed by persons driving cars. Damage slight in specially designed structures; considerable in ordinary substantial buildings with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stack, columns, monuments, walls. Sand and mud ejected in small amounts. Changes in well water. Persons driving cars disturbed. Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings, with partial collapse. Buildings shifted off foundations. Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations; ground badly cracked. Landslides considerable from river banks and steep slopes. Shifted sand and mud. Water splashed, slopped over banks. X Rossi-Forel scale More than 0. Few, if any, masonry structures remain standing. Broad fissures in ground. Underground pipelines completely out of service. Earth slumps and land slips in soft ground. Waves seen on ground surface. Lines of sight and level distorted. Objects thrown into the air.

Chapter 3 : Richter Scale and Mercalli Scale

The Modified Mercalli Intensity (MMI) scale depicts shaking severity. An earthquake has a single magnitude that indicates the overall size and energy released by the earthquake.

Not felt except by a very few under especially favorable conditions. Felt only by a few persons at rest, especially on upper floors of buildings. Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably. Felt by nearly everyone; many awakened. Some dishes, windows broken. Pendulum clocks may stop. Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken. Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations. Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Few, if any masonry structures remain standing. Lines of sight and level are distorted. Objects thrown into the air. From The Severity of an Earthquake.

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Chapter 4 : The Modified Mercalli Intensity Scale

The Modified Mercalli Intensity Scale The effect of an earthquake on the Earth's surface is called the intensity. The intensity scale consists of a series of certain key responses such as people awakening, movement of furniture, damage to chimneys, and finally--total destruction.

Barely sensed only by a very few people. Scarcely felt Felt only by a few people at rest in houses or on upper floors. Weak Felt indoors as a light vibration. Hanging objects may swing slightly. Largely observed Generally noticed indoors, but not outside, as a moderate vibration or jolt. Light sleepers may be awakened. Walls may creak, and glassware, crockery, doors or windows rattle. Strong Generally felt outside and by almost everyone indoors. Most sleepers are awakened and a few people alarmed. Small objects are shifted or overturned, and pictures knock against the wall. Some glassware and crockery may break, and loosely secured doors may swing open and shut. Slightly damaging Felt by all. People and animals are alarmed, and many run outside. Walking steadily is difficult. Furniture and appliances may move on smooth surfaces, and objects fall from walls and shelves. Glassware and crockery break. Slight non-structural damage to buildings may occur. People experience difficulty standing. Furniture and appliances are shifted. Substantial damage to fragile or unsecured objects. A few weak buildings are damaged. Heavily damaging Alarm may approach panic. A few buildings are damaged and some weak buildings are destroyed. Destructive Some buildings are damaged and many weak buildings are destroyed. Very destructive Many buildings are damaged and most weak buildings are destroyed. Devastating Most buildings are damaged and many buildings are destroyed. Completely devastating All buildings are damaged and most buildings are destroyed.

Chapter 5 : Talk:Mercalli intensity scale - Wikipedia

Mercalli Intensity: Equivalent Richter Magnitude: Witness Observations: I: to Felt by very few people; barely noticeable. II: to Felt by a few.

Few buildings remain standing; bridges and railways destroyed;water, gas, electricity and telephones out of action. XII 8 or greater Total destruction; objects are thrown into the air,much heaving,shaking and distortion of the ground Whilst this scale is fine if you happen to experience an earthquake in an inhabited area of a developed country, it is of no use whatsoever in the middle of a desert or in any other place without trees, houses and railways! Descriptions such as "Resembling vibrations caused by heavy traffic. Clearly this scale has advantages, but something else is required if we are to be able to compare the magnitude of earthquakes wherever they occur. The Intensity Scale differs from the Richter Magnitude Scale in that the effects of any one earthquake vary greatly from place to place, so there may be many Intensity values e. IV, VII measured for the same earthquake. Each earthquake, on the other hand, should have only one Magnitude, although the various methods of calculating it may give slightly different values e. The Richter Scale is designed to allow easier comparison of earthquake magnitudes, regardless of the location. Richter was a geologist living and working in California, U. The Richter scale for earthquake measurements is logarithmic. This means that each whole number step represents a ten-fold increase in measured amplitude. Thus, a magnitude 7 earthquake is 10 times larger than a 6, times larger than a magnitude 5 and times as large as a 4 magnitude. This is an open ended scale since it is based on measurements not descriptions. An earthquake detected only by very sensitive people registers as 3. When trying to understand the forces of an earthquake it can help to concentrate just upon the up and down movements. Gravity is a force pulling things down towards the earth. This accelerates objects at 9. To make something, such as a tin can, jump up into the air requires a shock wave to hit it from underneath travelling faster than 9. This roughly corresponds to 11 Very disastrous on the Mercalli Scale, and 8. In everyday terms, the tin can must be hit by a force that is greater than that which you would experience if you drove your car into a solid wall at 35 khp 22 mph.

Chapter 6 : Modified Mercalli Intensity

The Modified Mercalli Intensity Scale of is the basis for the U.S. evaluation of seismic www.nxgvision.comity is different than the magnitude in that it is based on observations of the effects and damage of an earthquake, not on scientific measurements.

It depends on where you are. An earthquake can be measured by the amount of energy released. The Richter scale uses Arabic numbers to rate the amount of energy, or its magnitude. The size or strength of an earthquake may be measured by the intensity or kind of damage that occurs. Intensity depends on your distance from the epicenter and the geologic area. Roman numerals are used to rate the intensity and damage. An earthquake may have a different intensity rating at different locations. However, damage may depend on the type of structure, construction, or type of soil on which the structure was built. For example, a building on bedrock experiences less movement than a building on loose sediments. The Modified Mercalli MM scale reads as follows: Not felt except by a very few under especially favorable circumstances. People lying down might feel the earthquake. Light suspended objects may sway. People indoors will probably feel it, but those outside may not. Nearly everybody feels it. Doors swing, pictures move, things tip over. Everyone feels the earthquake. It is hard to walk. Windows and dishes broken. Books fall from shelves. It is hard to stand. Plaster, bricks and tiles fall from buildings. People will not be able dive cars. Poorly built buildings may collapse, chimneys may fall. Most foundations are damaged. Most buildings are destroyed. Water is thrown out of rivers and lakes. Bridges and underground pipelines unusable. Most objects are leveled. Large objects may be thrown into the air. Large rock masses displaced.

Chapter 7 : Mercalli Scale vs. Richter Scale

The Mercalli intensity scale (or more precisely the Modified Mercalli intensity scale) is a scale to measure the intensity of www.nxgvision.com with the Richter scale, the Mercalli scale does not take into account energy of an earthquake directly.

Fault geology â€" In geology, a fault is a planar fracture or discontinuity in a volume of rock, across which there has been significant displacement as a result of rock-mass movement. Large faults within the Earths crust result from the action of tectonic forces. Energy release associated with movement on active faults is the cause of most earthquakes. A fault plane is the plane that represents the surface of a fault. A fault trace or fault line is the intersection of a plane with the ground surface. A fault trace is also the line commonly plotted on maps to represent a fault. Since faults do not usually consist of a single, clean fracture, the two sides of a non-vertical fault are known as the hanging wall and footwall. By definition, the wall occurs above the fault plane. This terminology comes from mining, when working a tabular ore body, because of friction and the rigidity of rocks, they cannot glide or flow past each other easily, and occasionally all movement stops. A fault in ductile rocks can also release instantaneously when the rate is too great. The energy released by instantaneous strain-release causes earthquakes, a common phenomenon along transform boundaries, slip is defined as the relative movement of geological features present on either side of a fault plane, and is a displacement vector. A faults sense of slip is defined as the motion of the rock on each side of the fault with respect to the other side. In practice, it is only possible to find the slip direction of faults. Based on direction of slip, faults can be categorized as, strike-slip. The fault surface is usually vertical and the footwall moves either left or right or laterally with very little vertical motion. Strike-slip faults with left-lateral motion are known as sinistral faults. Those with right-lateral motion are known as dextral faults 2. Seismometer â€" Seismometers are instruments that measure motion of the ground, including those of seismic waves generated by earthquakes, volcanic eruptions, and other seismic sources. Records of seismic waves allow seismologists to map the interior of the Earth, the seismometer was invented by the Chinese polymath Zhang Heng in AD during the Han dynasty. The first Western description of a comes from the French physicist and priest Jean de Hautefeuille in The concerning technical discipline is called seismometry, a branch of seismology, a simple seismometer that is sensitive to up-down motions of the earth can be understood by visualizing a weight hanging on a spring. Any movement of the moves the frame. The mass tends not to move because of its inertia, early seismometers used optical levers or mechanical linkages to amplify the small motions involved, recording on soot-covered paper or photographic paper. In some systems, the mass is held nearly motionless relative to the frame by a negative feedback loop. The motion of the relative to the frame is measured. The voltage needed to produce this force is the output of the seismometer, in other systems the weight is allowed to move, and its motion produces a voltage in a coil attached to the mass and moving through the magnetic field of a magnet attached to the frame. This design is used in the geophones used in seismic surveys for oil. Professional seismic observatories usually have instruments measuring three axes, north-south, east-west, and the vertical, if only one axis is measured, this is usually the vertical because it is less noisy and gives better records of some seismic waves. The foundation of a station is critical. A professional station is mounted on bedrock. The best mountings may be in deep boreholes, which avoid thermal effects, ground noise and tilting from weather, other instruments are often mounted in insulated enclosures on small buried piers of unreinforced concrete. Reinforcing rods and aggregates would distort the pier as the temperature changes, a site is always surveyed for ground noise with a temporary installation before pouring the pier and laying conduit. Originally, European seismographs were placed in an area after a destructive earthquake 3. Earthquake engineering â€" Earthquake engineering is an interdisciplinary branch of engineering that designs and analyzes structures, such as buildings and bridges, with earthquakes in mind. Its overall goal is to such structures more resistant to earthquakes. An earthquake engineer aims to construct structures that will not be damaged in minor shaking, the main objectives of earthquake engineering are, Foresee the potential consequences of strong earthquakes on urban areas and civil infrastructure. Design, construct and maintain structures to perform at earthquake exposure up to the expectations, a properly engineered structure does not necessarily have to be extremely strong or expensive. It has to be designed to withstand the seismic effects while sustaining an acceptable level of damage. Seismic loading means application of an earthquake-generated excitation on a structure and it happens at contact surfaces of a structure either with the ground, with adjacent structures, or with gravity waves from tsunami. The loading that is expected at a location on the Earths surface is estimated by engineering seismology. It is related to the hazard of the location. Earthquake or seismic performance defines an ability to sustain its main functions, such as its safety and serviceability, at. A structure is considered safe if it does not endanger the lives. A structure may be considered if it is able to fulfill its operational functions for which it was designed. On the other hand, it should remain operational for more frequent, engineers need to know the quantified level of the actual or anticipated seismic performance associated with the direct damage to an individual building subject to a specified ground shaking. Such an assessment may be performed either experimentally or analytically, Experimental evaluations are expensive tests that are typically done by placing a model of the structure on a shake-table that simulates the earth shaking and observing its behavior. Such kinds of experiments were first performed more than a century ago, only recently has it become possible to perform 1,1 scale testing on full structures. Due to the nature of such tests, they tend to be used mainly for understanding the seismic behavior of structures, validating models. Thus, once validated, computational models and numerical procedures tend to carry the major burden for the seismic performance assessment of structures. The technique as a concept is a relatively recent development. In general, seismic structural analysis is based on the methods of structural dynamics, for decades, the most prominent instrument of seismic analysis has been the earthquake response spectrum method which also contributed to the proposed building codes concept of today 4. Pendulum clock â€” A pendulum clock is a clock that uses a pendulum, a swinging weight, as its timekeeping element. The advantage of a pendulum for timekeeping is that it is an oscillator, it swings back and forth in a precise time interval dependent on its length. From its invention in by Christiaan Huygens until the s, Pendulum clocks must be stationary to operate, any motion or accelerations will affect the motion of the pendulum, causing inaccuracies, so other mechanisms must be used in portable timepieces. They are now mostly for their decorative and antique value. The pendulum clock was invented in by Dutch scientist and inventor Christiaan Huygens, Huygens contracted the construction of his clock designs to clockmaker Salomon Coster, who actually built the clock. Huygens was inspired by investigations of pendulums by Galileo Galilei beginning around , Galileo discovered the key property that makes pendulums useful timekeepers, isochronism, which means that the period of swing of a pendulum is approximately the same for different sized swings. Galileo had the idea for a clock in , which was partly constructed by his son in The anchor became the standard escapement used in pendulum clocks, in addition to increased accuracy, the anchors narrow pendulum swing allowed the clocks case to accommodate longer, slower pendulums, which needed less power and caused less wear on the movement. The increased accuracy resulting from these developments caused the hand, previously rare. The 18th and 19th century wave of innovation that followed the invention of the pendulum brought many improvements to pendulum clocks. Observation that pendulum clocks slowed down in summer brought the realization that thermal expansion and contraction of the rod with changes in temperature was a source of error. This was solved by the invention of temperature-compensated pendulums, the pendulum by George Graham in With these improvements, by the midth century precision pendulum clocks achieved accuracies of a few seconds per week, until the 19th century, clocks were handmade by individual craftsmen and were very expensive. The rich ornamentation of pendulum clocks of this period indicates their value as symbols of the wealthy. The clockmakers of each country and region in Europe developed their own distinctive styles, by the 19th century, factory production of clock parts gradually made pendulum clocks affordable by middle-class families. During the Industrial Revolution, daily life was organized around the pendulum clock 5. The organization has four science disciplines, concerning biology, geography, geology. The USGS is a research organization with no regulatory responsibility. The agencys previous slogan, adopted on the occasion of its anniversary, was Earth Science in the Public Service. Prompted by a report from the National Academy of Sciences, the USGS was created, by a last-minute amendment and it was charged with the classification of the public lands, and examination of the geological structure, mineral resources, and products of the national domain. This task was driven by the need to inventory the vast lands added to the United States by the Louisiana Purchase in , the legislation also provided that the Hayden, Powell, and Wheeler surveys be discontinued as of June 30, Clarence King, the first director of USGS, assembled the new organization from disparate regional survey agencies, after a short tenure, King was succeeded in the directors chair by John Wesley Powell. Administratively, it is divided into a Headquarters unit and six Regional Units, Other specific programs include, Earthquake Hazards Program monitors earthquake activity worldwide. The USGS informs authorities, emergency responders, the media, and it also maintains long-term archives of earthquake data for scientific and engineering research. Real-time streamflow data are available online, since , the Astrogeology Research Program has been involved in global, lunar, and planetary exploration and mapping. Salta â€" Salta is a city located in the Lerma Valley, at 1, metres above sea level in the northwest part of Argentina. It is also the name for the city of Salta Province. Along with its area, it has a population of , inhabitants. It is situated in the Lerma Valley,1, metres above sea level, the weather is warm and dry, with annual averages of mm of rainfall and an average temperature of January, February and march are the months with greatest rainfall, during the spring, Salta is occasionally plagued by severe, week-long dust storms. Nicknamed Salta la Linda, it has become a major tourist destination due to its old, colonial architecture, tourism friendliness, excellent weather and natural scenery of the valleys westward. Attractions in the city include the 18th century Cabildo, the neo-classical style Cathedral. Salta used to be the point of the Train to the Clouds. Salta was founded on April 16, by the Spanish conquistador Hernando de Lerma, the origin of the name Salta is a matter of conjecture, with several theories being advanced to explain it. During the war of independence, the city became a commercial, Salta emerged from the War of Independence politically in disarray and financially bankrupt, a condition that lingered throughout much of the 19th century. Salta has a highland climate, and it is famous in Argentina for having very pleasant weather. During the rest of the year, blue skies dominate the region, Salta receives hours of bright sunshine each year or about 5. The highest recorded temperature was The Plaza is almost completely surrounded by a gallery, within walking distance of the 9th July Square are the Saint Francis Church and the citys three pedestrian streets, Alberdi, Florida and Caseros 7. Earthquake â€" An earthquake is the shaking of the surface of the Earth, resulting from the sudden release of energy in the Earths lithosphere that creates seismic waves. Earthquakes can range in size from those that are so weak that they cannot be felt to those violent enough to people around. The seismicity or seismic activity of an area refers to the frequency, type, Earthquakes are measured using measurements from seismometers. The moment magnitude is the most common scale on which earthquakes larger than approximately 5 are reported for the entire globe and these two scales are numerically similar over their range of validity. Magnitude 3 or lower earthquakes are mostly imperceptible or weak and magnitude 7 and over potentially cause damage over larger areas. The largest earthquakes in historic times have been of magnitude slightly over 9, intensity of shaking is measured on the modified Mercalli scale. The shallower an earthquake, the damage to structures it causes. At the Earths surface, earthquakes manifest themselves by shaking and sometimes displacement of the ground, when the epicenter of a large earthquake is located offshore, the seabed may be displaced sufficiently to cause a tsunami. Earthquakes can also trigger landslides, and occasionally volcanic activity, in its most general sense, the word earthquake is used to describe any seismic event â€" whether natural or caused by humans â€" that generates seismic waves.

Chapter 8 : Magnitude / Intensity Comparison

The Modified Mercalli scale used in the United States assigns a Roman numeral in the range I - XII to each earthquake effect. The methodology is simple. At each location assign a numeral to describe the earthquake effect.

Richter Scale Mercalli Scale vs. Richter Scale There is an earthquake usually taking place somewhere in the world every day. The earthquake and its impact is measured either by using the Mercalli scale or the Richter Scale. The two scales, however, each have different applications as well as measurement techniques. The Mercalli scale has been in existence longer dating back to the 19th century. Its name comes from the modifications made to it in the s by an Italian volcanologist, Giuseppe Mercalli. Ironically, it was Charles Richter who gave the scale its updated form which is used today, presently called the MMI scale, or known as the Modified Mercalli scale. The Richter scale was developed in by Charles Richter, along with his associate, Beno Gutenberg, and today it is the commonly used scale in earthquake measurement. It was first developed for use in a particular area of California comparing the size of different quakes in the region. It was later adapted for use around the world. The Richter scale is more objective, but the Mercalli scale is subjective. The Mercalli scale bases its measurement on the observed effects of the earthquake and describes its intensity. It is a linear measurement. It is a logarithmic. For example, a magnitude 4 earthquake is 10 times as tense as a magnitude 3 earthquake. It is also based on the effect on humans, objects, and man-made structures. The logarithmic scale for the Richter is base and is based on the amplitude of waves. The linear scale for the Mercalli ranges from I, meaning not felt, to XII, which is total destruction of the area affected by the quake. The consistency of the scale varies and depends on the distance from the epicenter. On the other hand, the scale on the Richter ranges from 2. The consistency of the scale varies at different distances from the epicenter, but a single value is given for the quake as a whole. When comparing the values, VIII on the Mercalli scale is similar to a 6 or 7 on the Richter scale, indicating chimneys falling and there is some damage to buildings. An XI on the Mercalli scale is similar to an 8 on the Richter scale, indicating the destruction of most buildings and bridges. The Mercalli scale is not as useful for measuring earthquakes, especially in uninhabited areas where the destruction and its strength is not apparent. The scale is considered less scientific because it relies on eyewitness accounts of the loss and destruction caused by the quake. It is, though, useful when comparing two areas where an earthquake occurred. The Richter scale is a scientific measurement based on the magnitude of the earthquake and allows experts to use more accuracy in comparing the strength of quakes across time and at different locations or even areas of the world. The Richter scale is used much more often around the world than the Mercalli scale, which mainly relies on eyewitness accounts of loss and destruction.

Chapter 9 : Mercalli intensity scale - Wikipedia

The Mercalli Intensity Scale was developed by Italian volcanologist Giuseppe Mercalli in and expanded to include 12 degrees of intensity in by Adolfo Cancani. It was modified again by Harry O. Wood and Frank Neumann in

Not felt by many people unless in favourable conditions. Feeble Felt only by a few people at best, especially on the upper floors of buildings. Delicately suspended objects may swing. Slight Felt quite noticeably by people indoors, especially on the upper floors of buildings. Many do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibration similar to the passing of a truck. Moderate Felt indoors by many people, outdoors by few people during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rock noticeably. Dishes and windows rattle alarmingly. Rather Strong Felt outside by most, may not be felt by some outside in non-favourable conditions. Dishes and windows may break and large bells will ring. Vibrations like large train passing close to house. Strong Felt by all; many frightened and run outdoors, walk unsteadily. Windows, dishes, glassware broken; books fall off shelves; some heavy furniture moved or overturned; a few instances of fallen plaster. Very Strong Difficult to stand; furniture broken; damage negligible in building of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken. Noticed by people driving motor cars. Destructive Damage slight in specially designed structures; considerable in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Ruinous General panic; damage considerable in specially designed structures, well designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations. Disastrous Some well built wooden structures destroyed; most masonry and frame structures destroyed with foundation. Very Disastrous Few, if any masonry structures remain standing. Catastrophic Total damage - Everything is destroyed. Lines of sight and level distorted. Objects thrown into the air. The ground moves in waves or ripples. Large amounts of rock move position. Advertisements Correlation with physical quantities The Mercalli scale is not defined in terms of more rigorous, objectively quantifiable measurements such as shake amplitude, shake frequency, peak velocity, or peak acceleration. Human perceived shaking and building damage is best correlated with peak acceleration for lower-intensity events, and with peak velocity for higher-intensity events.