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No-profit association founded in December 2016

Cloud Developers

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Geologists

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Research and development of solutions based on new technologies (cloud, iot) related to natural phenomena.

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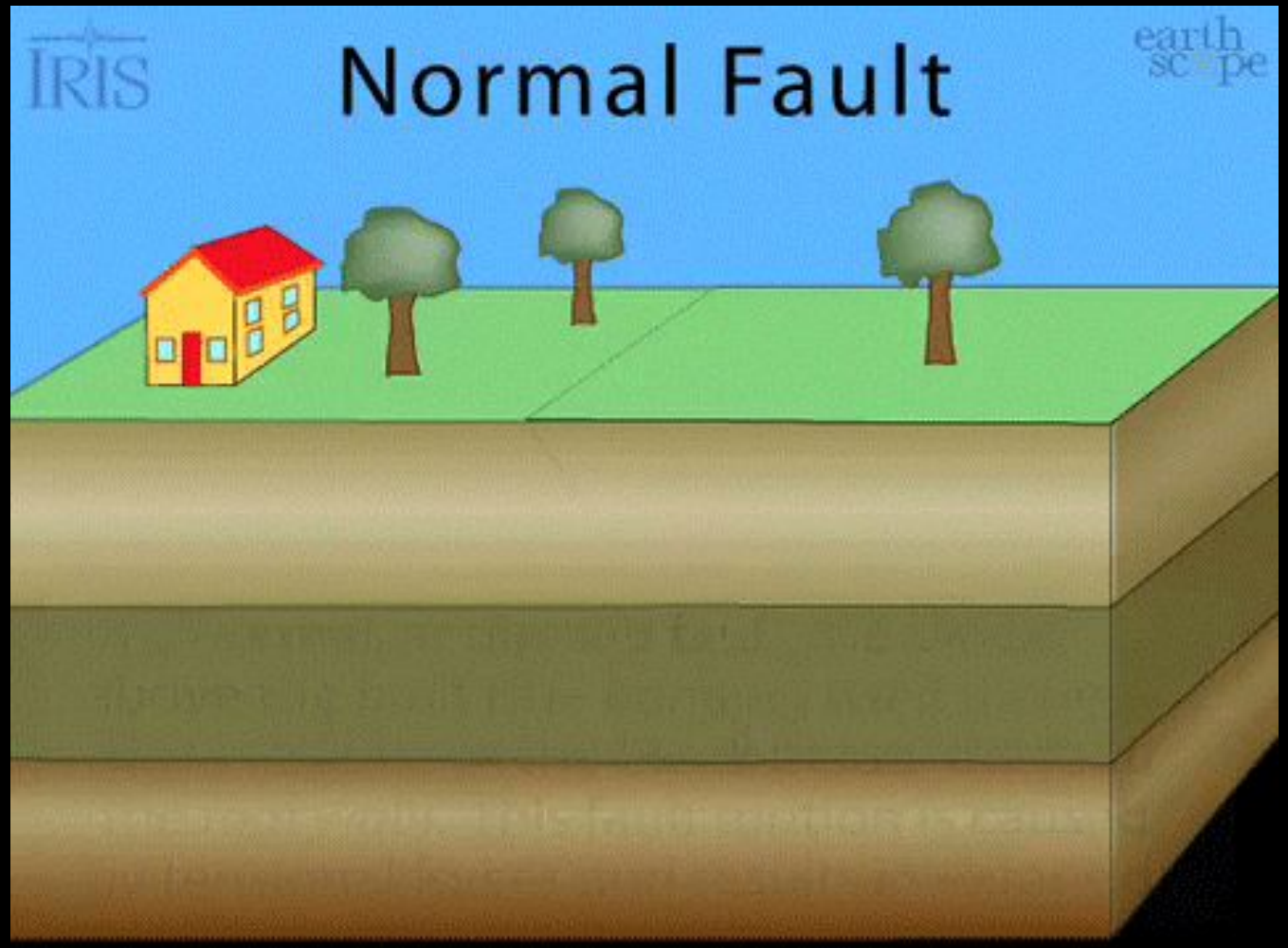
Enucleation‘s zone of earthquake



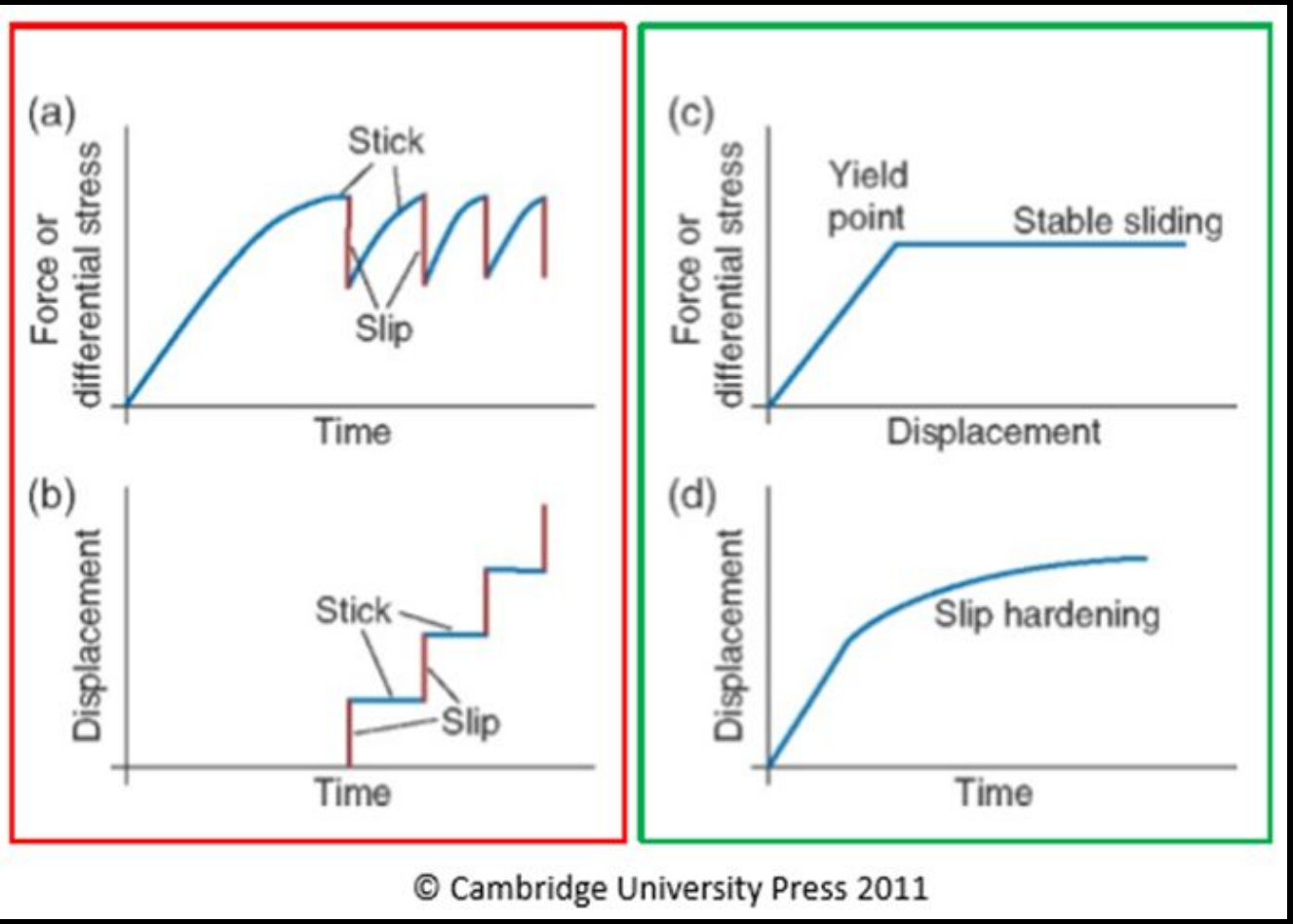
Earthquake's nucleation happens at depth along fault surfaces.

Fault surfaces slip during earthquakes, due to the sudden release of energy.

The Energy released during an earthquake is divided in: (1) slipping on fault surface, (2) generation of sesmic wave and (3)a lot of frictional heat.

$$E_{tot} = E_{wave} + E_{displacement} + E_{heat}$$

Stable sliding vs stick-slip

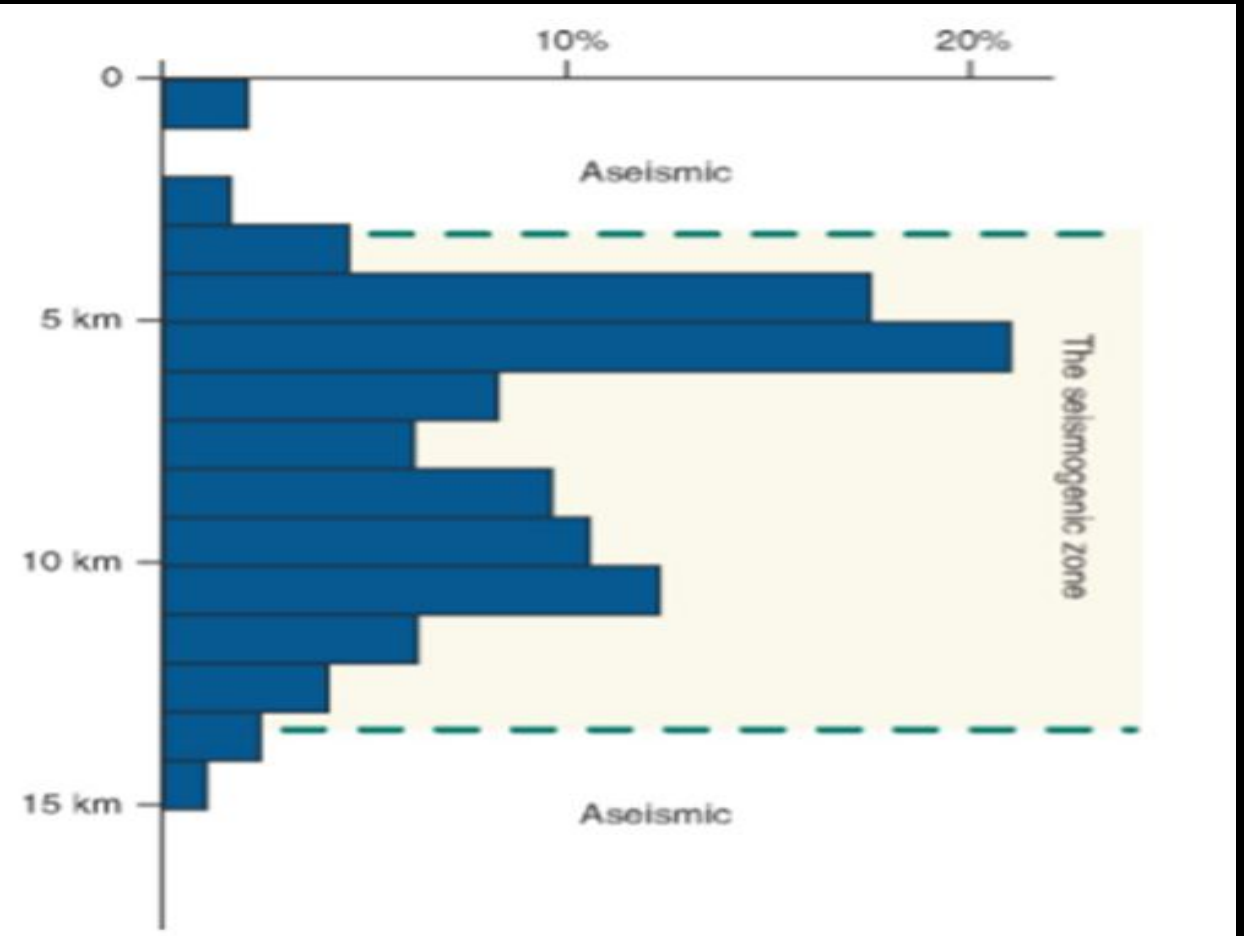


However not all faults generate earthquakes.

Faults have two kind of movement.

- Stable sliding (no earthquake, continuos sliding)
- Stick-Slip (earthquake, slow energy accumulation and sudden release)

The seismogenic zone



Distribuzione in profondità di 630 terremoti (Parkfield, California). Dati da Marone e Scholz, 1988. Da Fossen,

There is a seismogenic layer, where earthquakes take life.

This layer is situaded between 5 and 15 km of depth.

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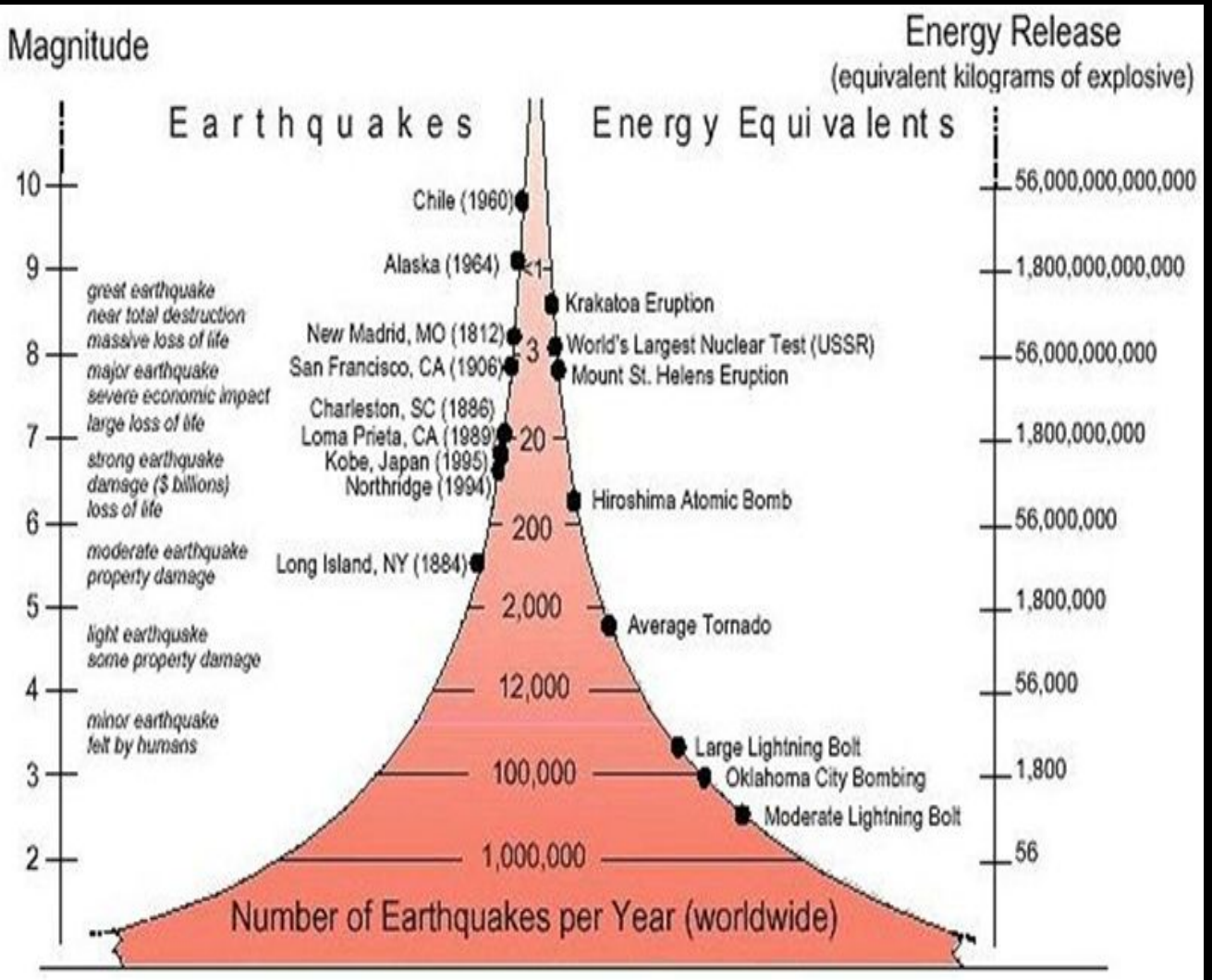
Magnitude (M_L) and frequency



The Richter Magnitude is determined to logarithm of the amplitude of waves recorder by seismographs.

Magnitude 6 (like Norcia earthquake) have an equivalent in TNT of Hiroshima atomic bomb

Luckly, the frequency of earthquakes is inversely proportional to the magnitude.

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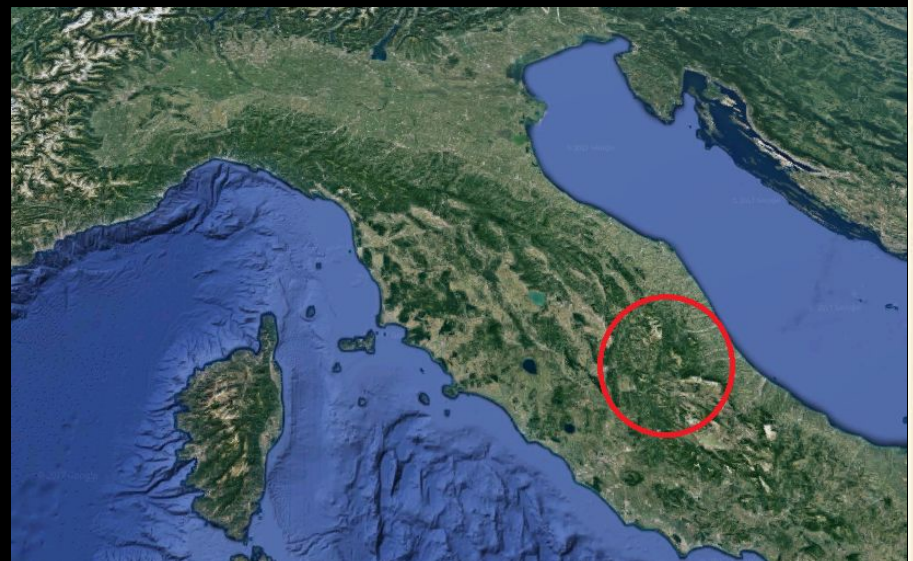
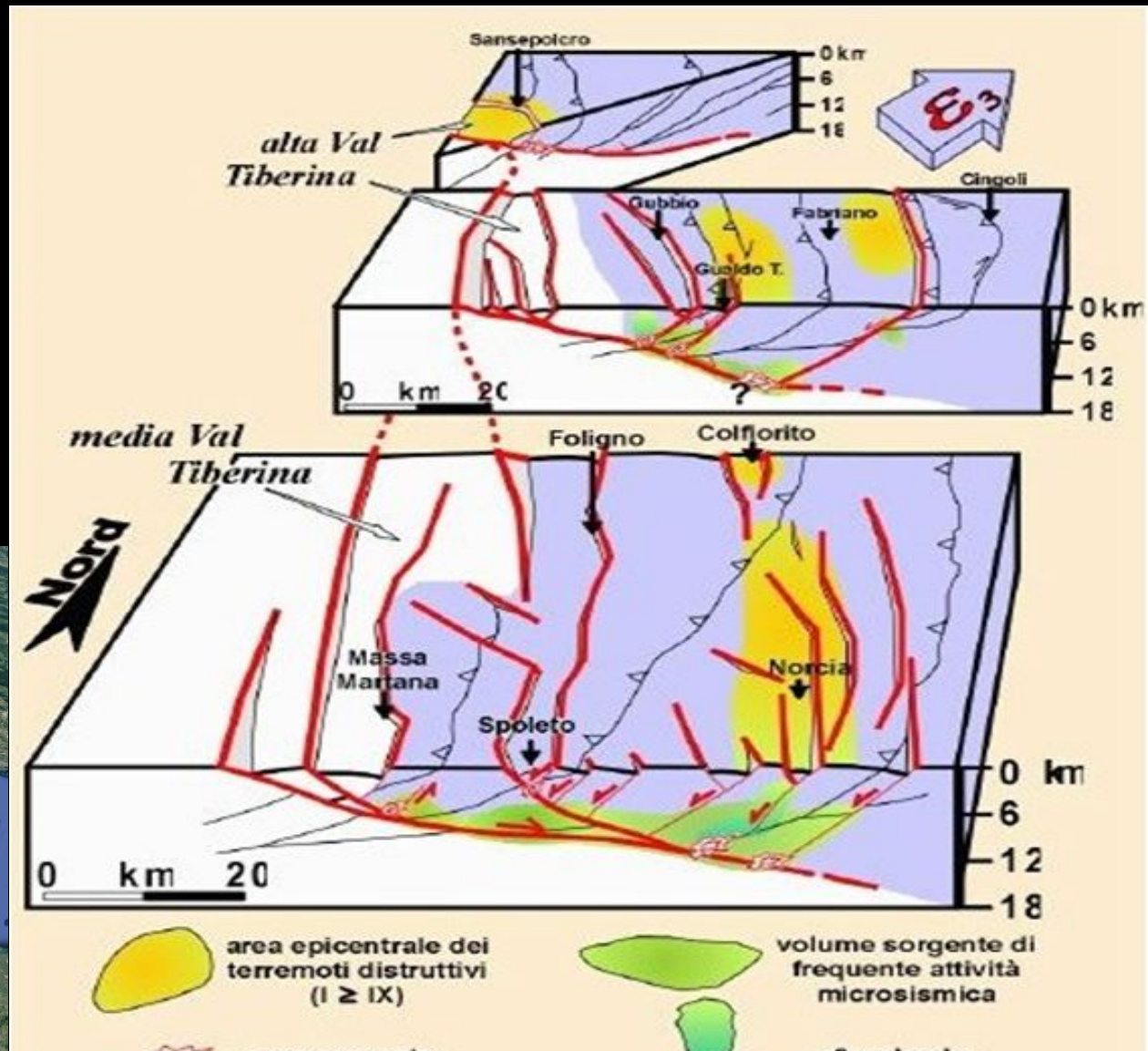
Bove-Vettore fault system

We will study the Bove-Vettore fault system.

A complex fault system in central Appennines, that has generated earthquakes of 2016 in Italy.





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Data for R

	A	B	C	D	E	F
1	#DataDa: 1985/04/05A: 2017/04/05					
2	#LatitudineMin: 42.29Max: 43.66					
3	#LongitudineMin: 11.97Max: 13.77					
4	#MagnitudoMin: 0.0Max: 10.0Tipo: Mag pref					
5	#Profondità (km)Min: NDMax: ND					
6	#Terremoti totali: 167142					
7	#Tempo Origine (UTC)	Latitudine	Longitudine	Profondità	Magnitudo	Fonte
8	2017-04-05 11:59:18.310	42.720	13.141	8.3	1.4--ML	SURVEY
9	2017-04-05 11:56:40.650	42.727	13.351	10.3	1.1--ML	SURVEY
10	2017-04-05 11:49:53.690	43.012	13.115	2.4	1.0--Md	SURVEY
11	2017-04-05 11:38:29.970	42.885	13.000	10.7	1.6--ML	SURVEY
12	2017-04-05 11:32:58.070	42.805	13.097	11.2	1.6--ML	SURVEY
13	2017-04-05 11:27:27.700	42.861	13.079	8.2	0.4--ML	SURVEY
14	2017-04-05 11:20:43.920	43.009	13.038	6.1	1.1--ML	SURVEY
15	2017-04-05 11:13:51.080	42.802	13.155	10.9	1.1--ML	SURVEY
16	2017-04-05 10:56:55.030	43.002	13.063	10.0	0.9--ML	SURVEY
17	2017-04-05 10:53:05.040	43.015	13.027	8.1	1.5--ML	SURVEY
18	2017-04-05 10:18:24.410	42.977	13.190	7.3	1.3--ML	SURVEY
19	2017-04-05 10:17:12.140	42.805	13.124	6.1	1.2--ML	SURVEY
20	2017-04-05 10:07:52.130	42.919	13.107	10.8	1.4--ML	SURVEY
21	2017-04-05 09:51:38.720	43.030	13.011	0.2	1.2--ML	SURVEY
22	2017-04-05 09:37:29.600	43.016	13.121	6.5	1.2--ML	SURVEY
23	2017-04-05 09:34:31.660	42.733	13.196	9.4	1.4--ML	SURVEY
24	2017-04-05 09:32:53.500	42.994	13.056	2.9	0.8--ML	SURVEY

Time:
to 04/1985
at 04/2017

Number of Events
167142

Area:
Lat. Min 42.29
Lat. Max 43.66
Long. Max 13.77
Long. Min 11.97

Data direct from:
Istituto Nazionale di Geofisica e Vulcanologia

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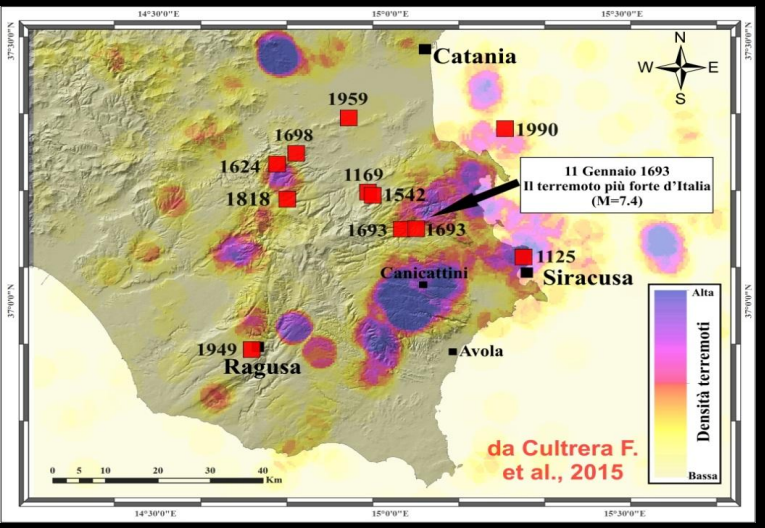
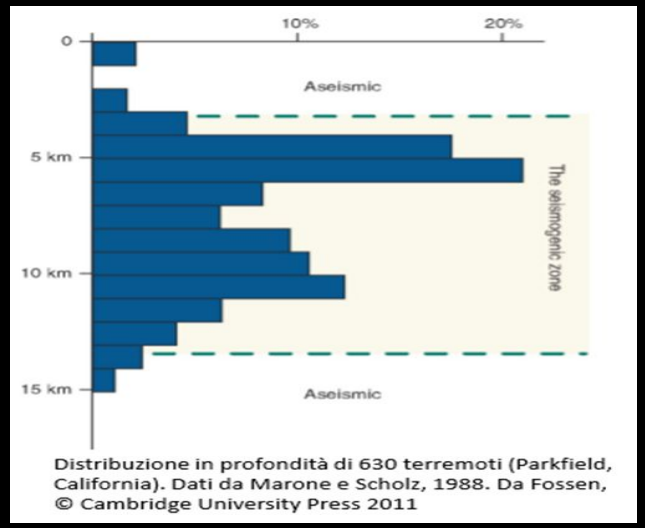
Suggestion

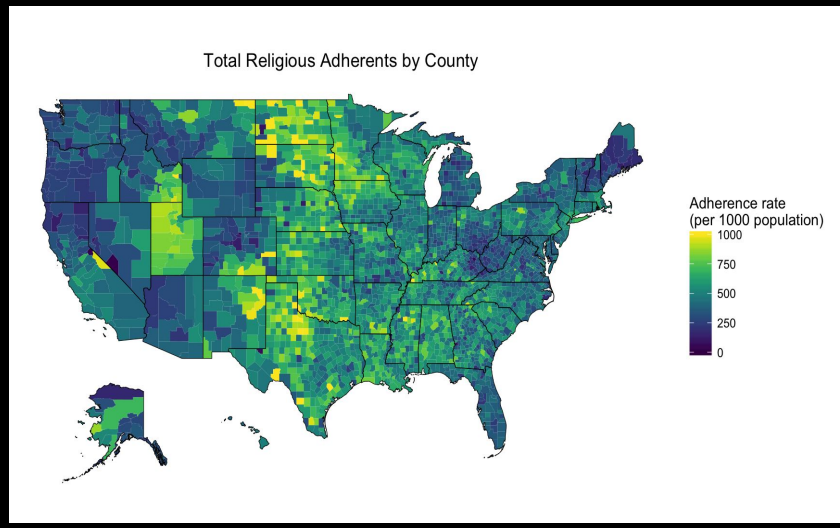


Dynamic time map of system faults evolution.

Classification's map of magnitude



Characterization & spatial distribution of the seismogenic zone depending on the magnitude



Density map of earthquake and different seismogenic source

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Have a good time!

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