

PROTEZIONE CIVILE

Presidenza del Consiglio dei Ministri  
Dipartimento della Protezione Civile



CNA  
PPC

CONSIGLIO NAZIONALE  
DEGLI ARCHITETTI  
PIANIFICATORI  
PAESAGGISTI  
E CONSERVATORI



CONSIGLIO NAZIONALE  
DEI GEOLOGI

## Sulla pericolosità sismica in Italia



Amatrice 24 agosto 2016

Carlo Doglioni

**Crosta** = 10-30 km

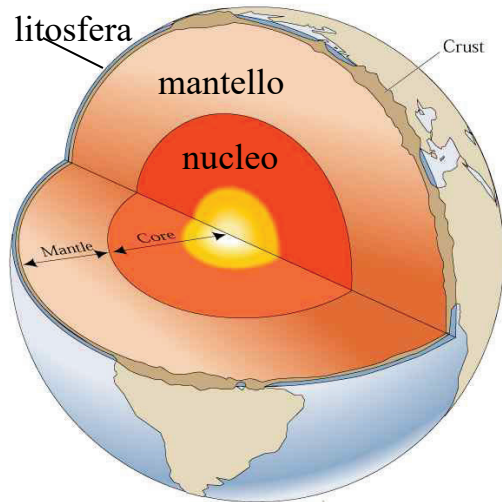
**Litosfera** = 100 km

**Mantello** = 100-2900 km

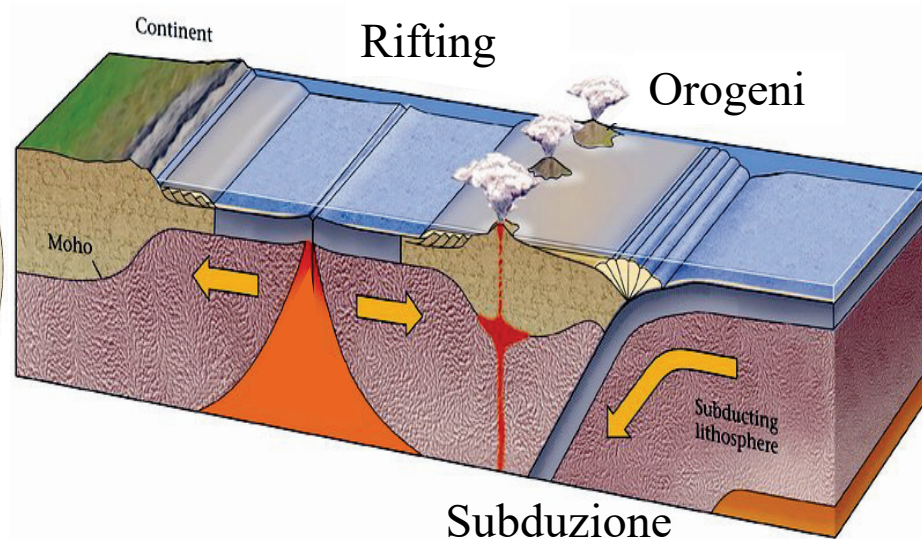
**Placca** = frammenti di litosfera

**Rifting** = placche si allontanano--> oceano

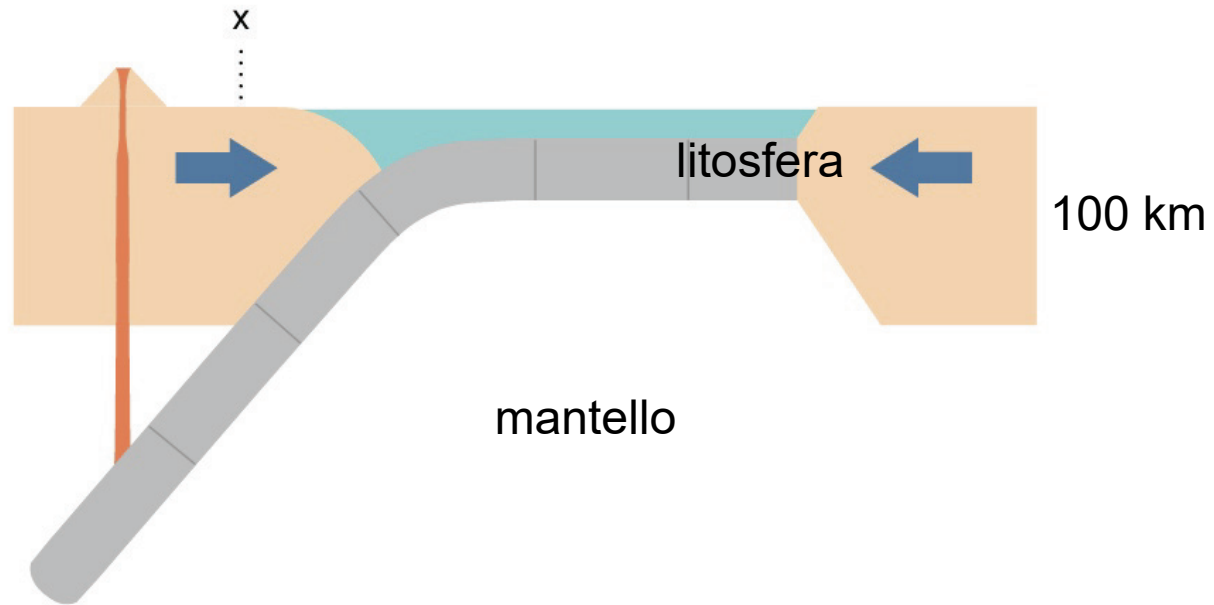
**Subduzione** = placche convergono--> orogene

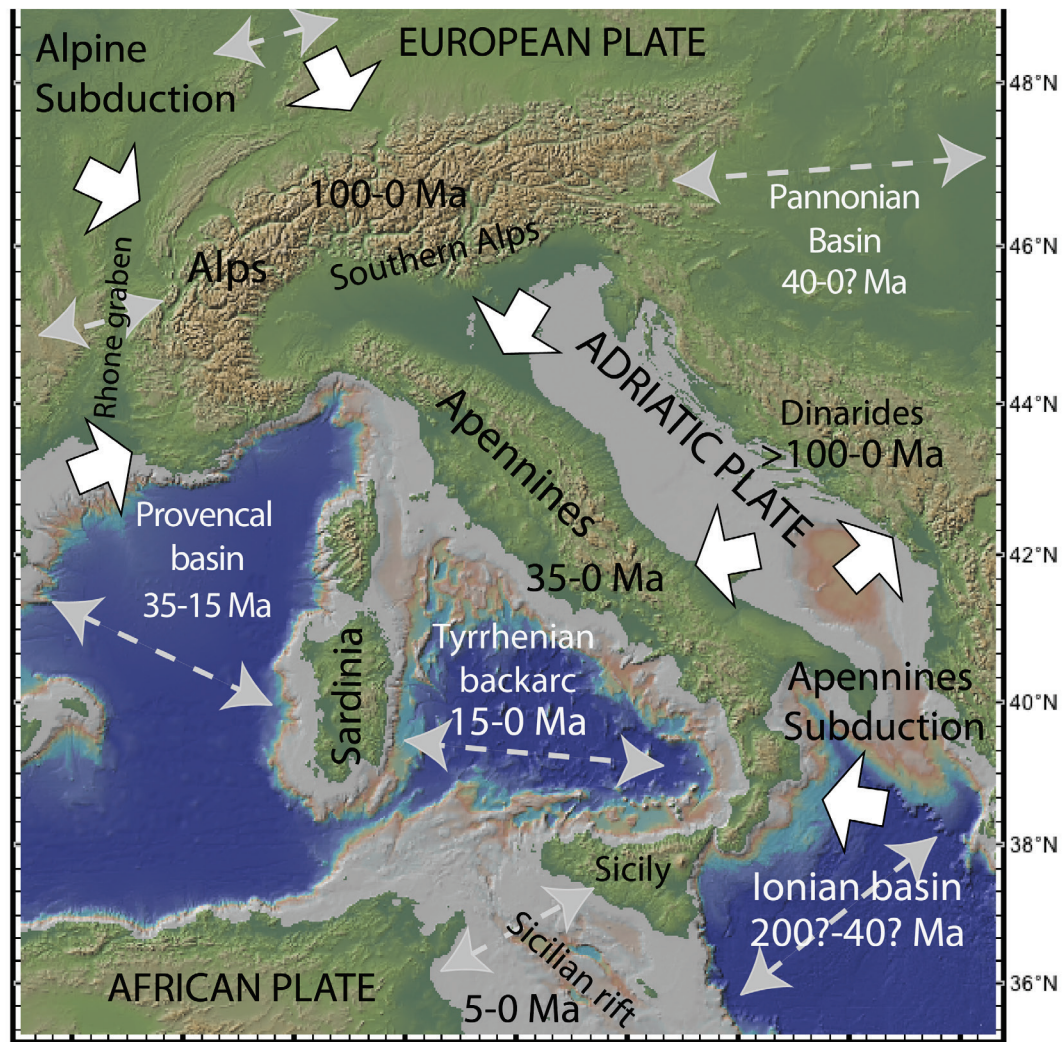


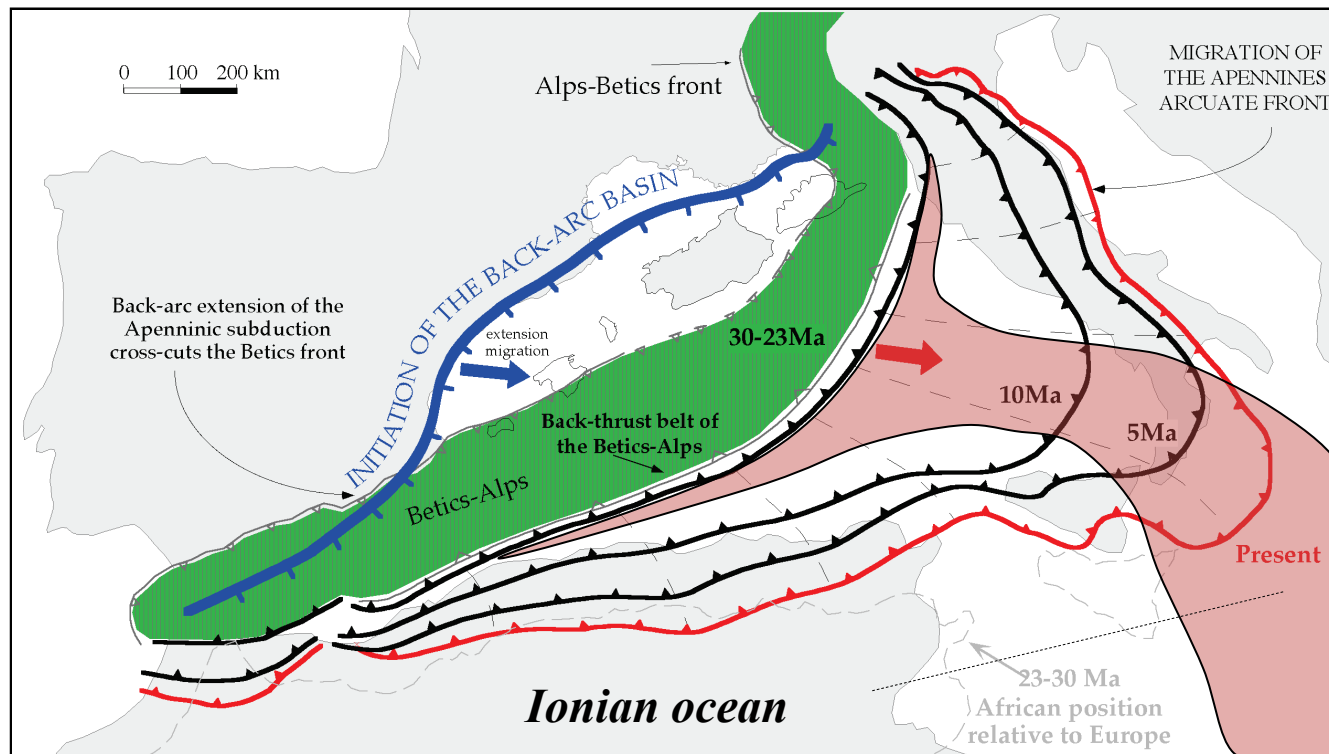
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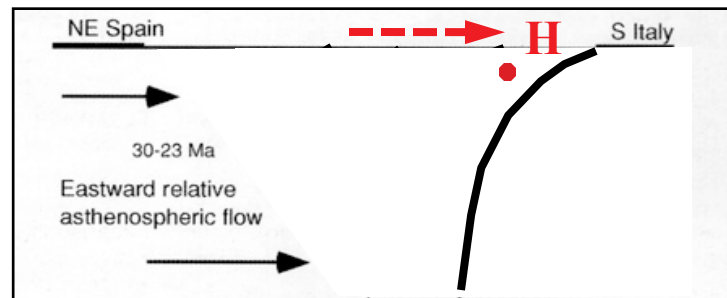
# SUBDUCTION

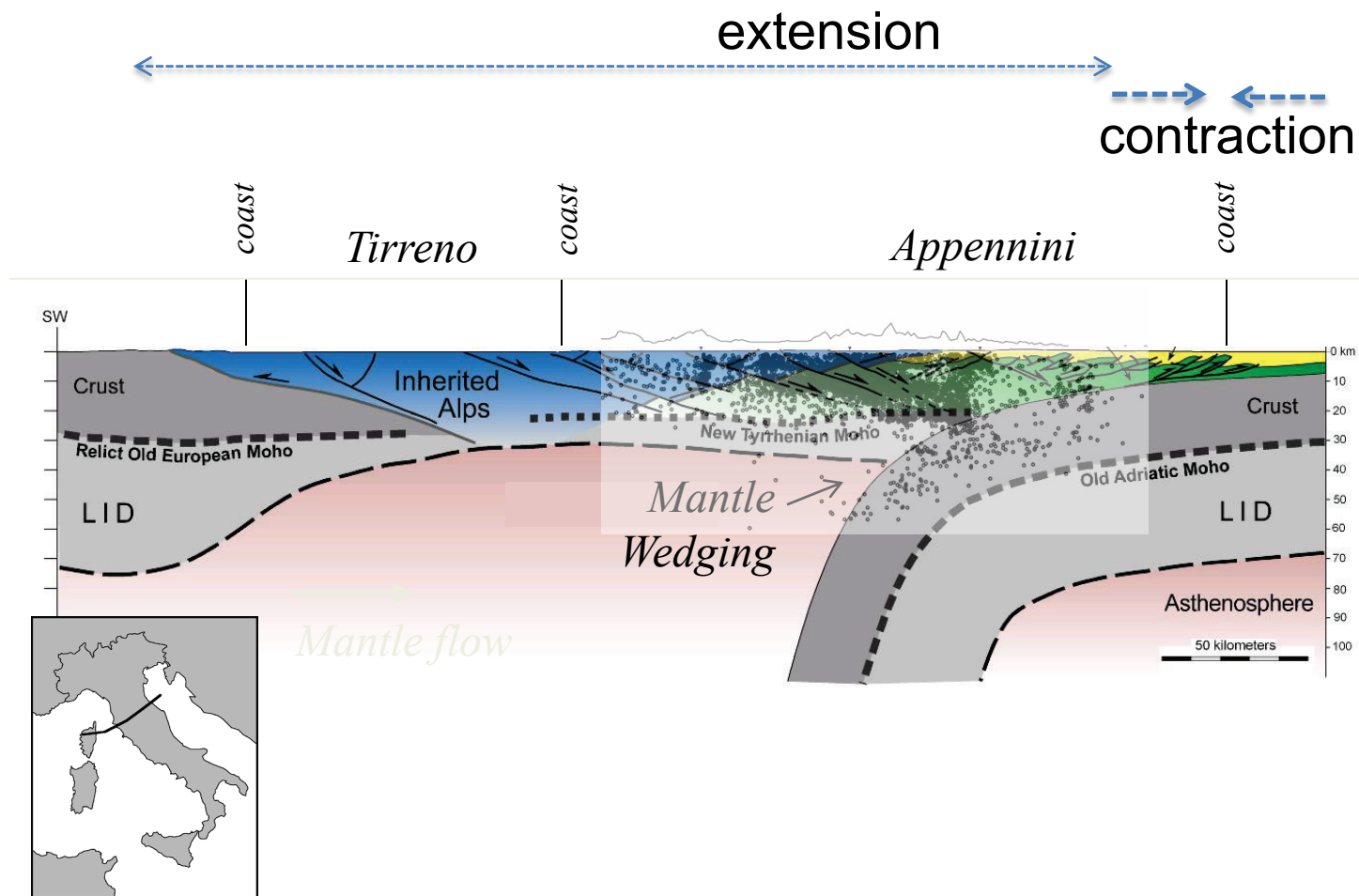






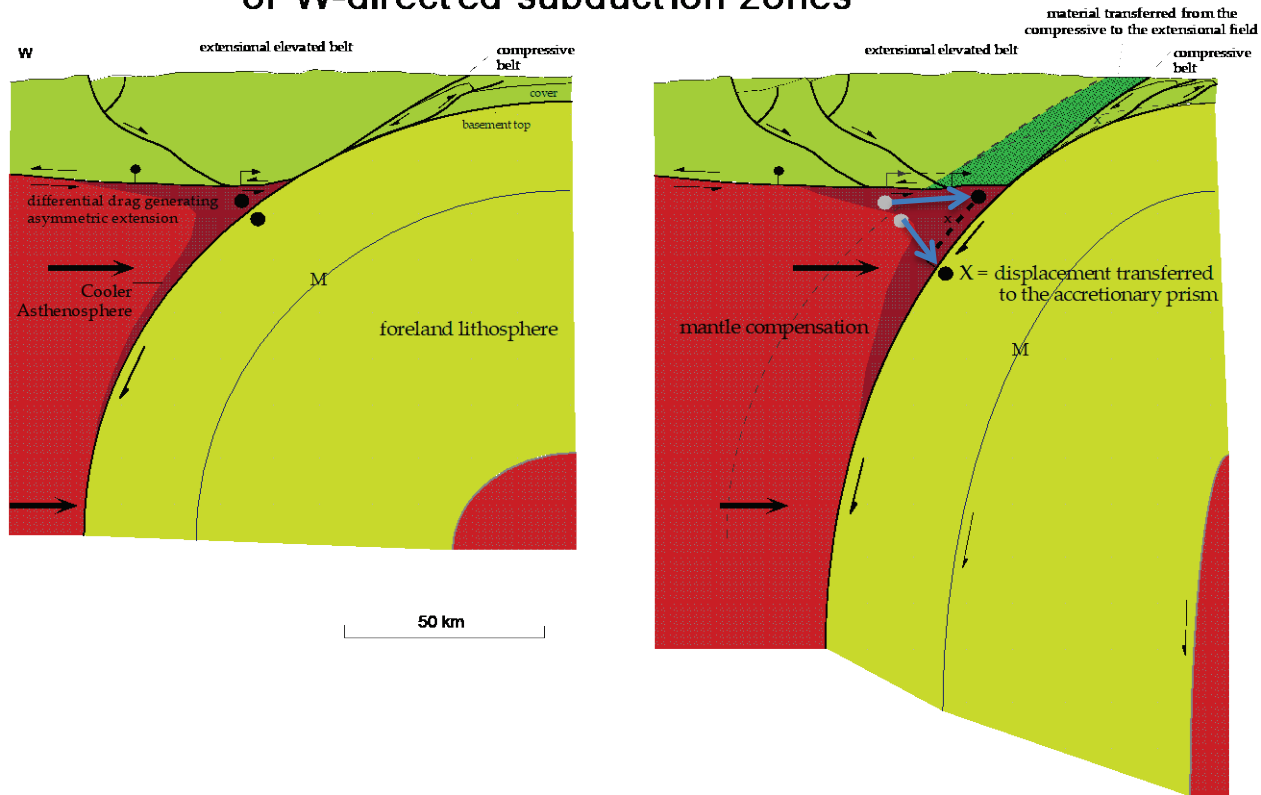
***E-ward slab retreat  
5 times faster than N-S  
convergence***







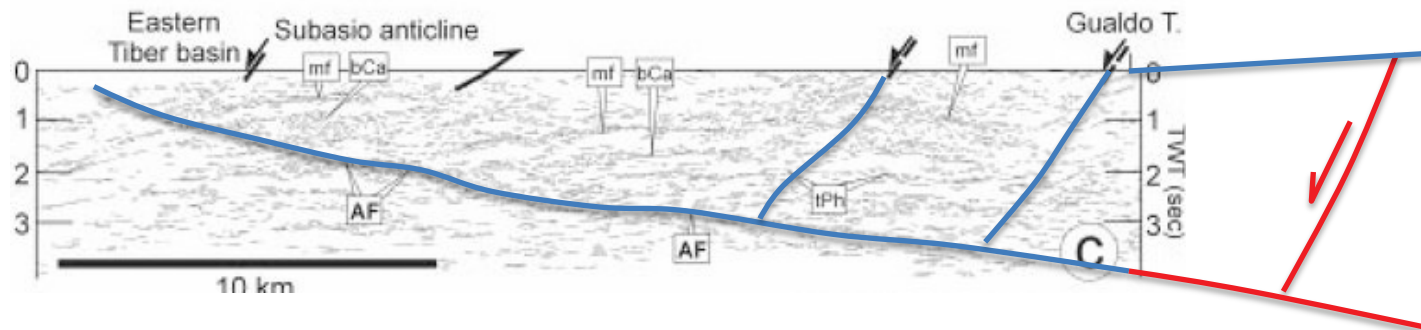
## kinematics of the extensional and compressional belts of W-directed subduction zones

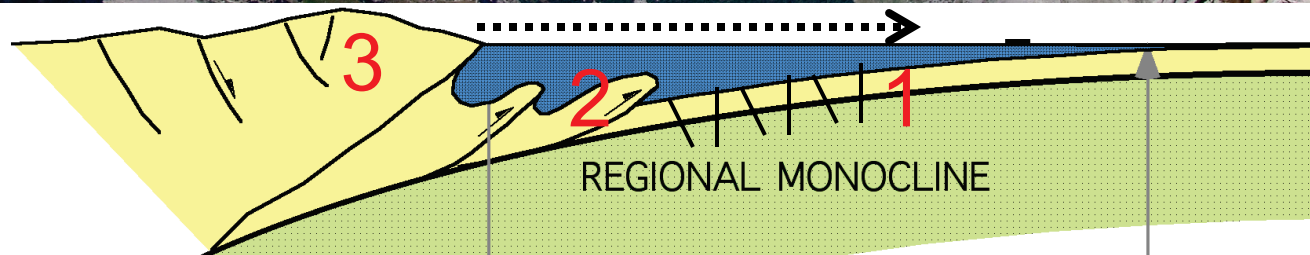


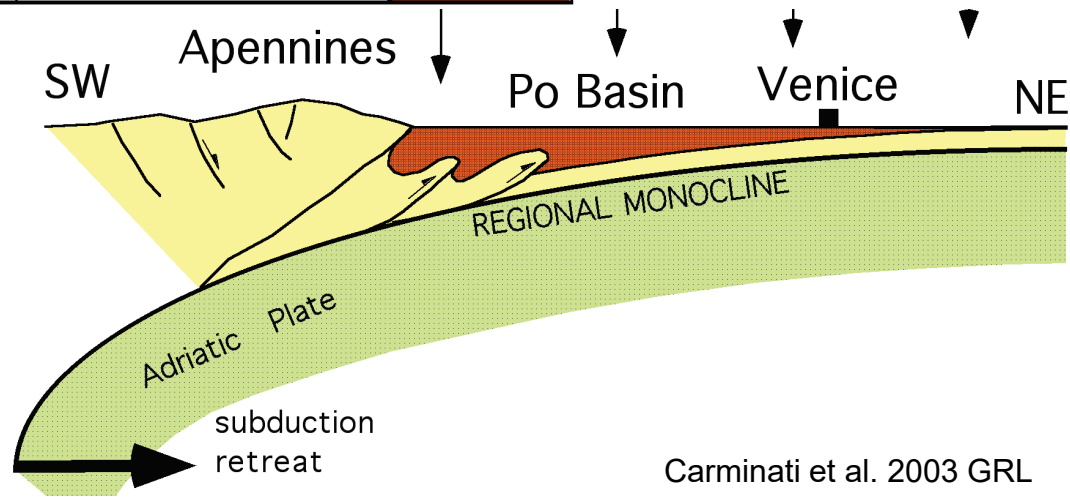
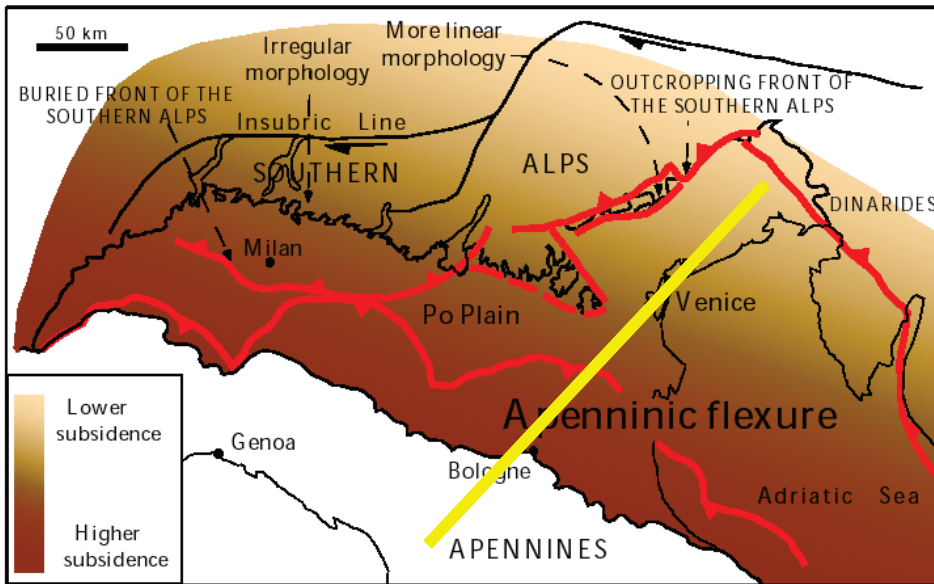




Boncio & Lavecchia 2000 JS

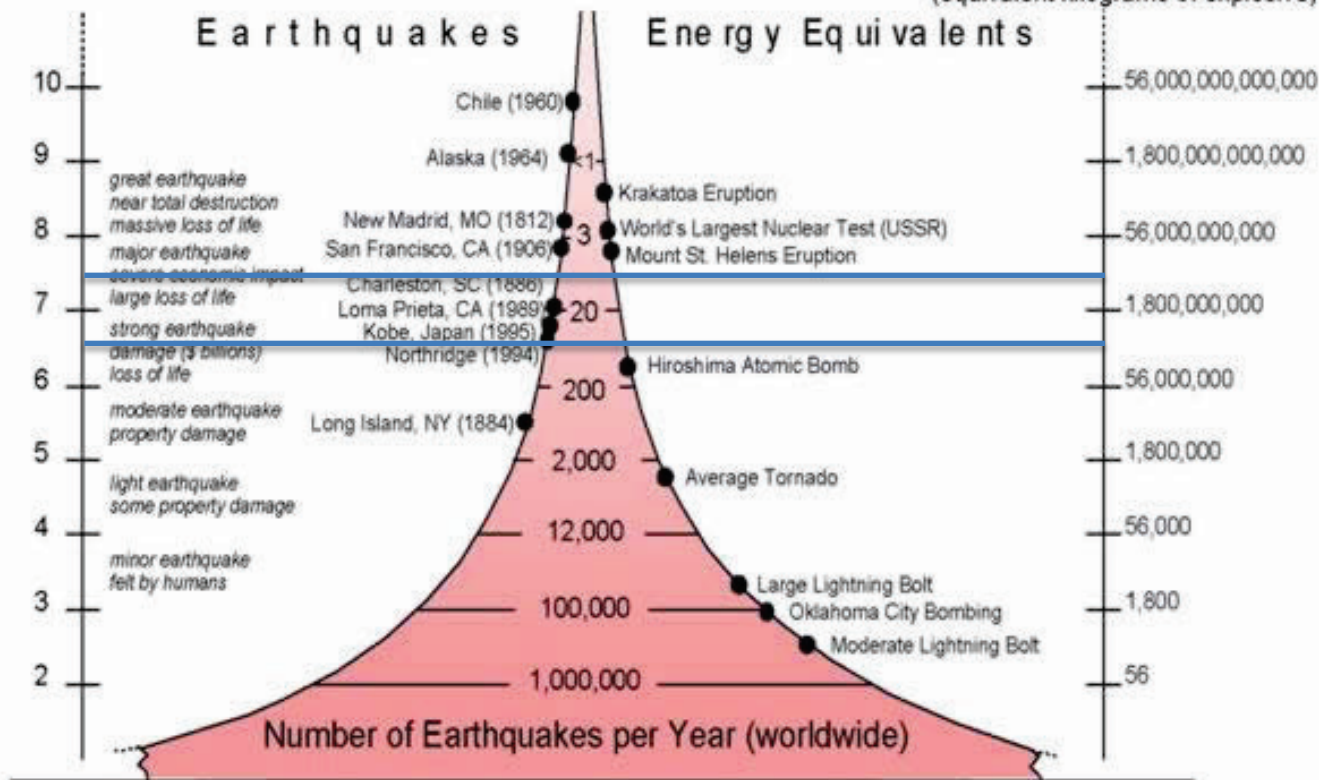






Magnitude

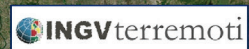
Energy Release  
(equivalent kilograms of explosive)





INGV





<http://ingvterremoti.wordpress.com>

2018



0 50 100 200  
Km

fonte dati: <http://cnt.rm.ingv.it>

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



<http://www.ingvterremoti.com>

2019

**Magnitudo**

- fino a 2
- da 2.0 a 2.9
- da 3.0 a 3.9
- da 4.0 a 4.9
- ★ da 5.0 in su

0 50 100 200  
Km

fonte dati: <http://terremoti.ingv.it>

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

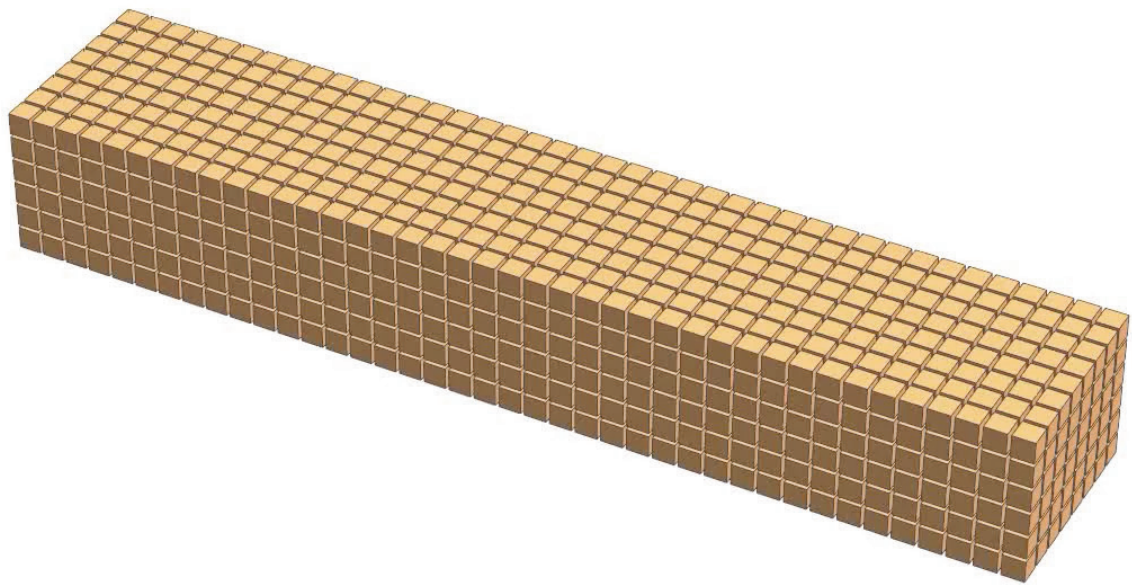
# P wave vs S wave



$P = 6 \text{ km/sec (3.7 mi/sec)}$

$S = 4 \text{ km/sec (2.5 mi/sec)}$

  
www.iris.edu



D

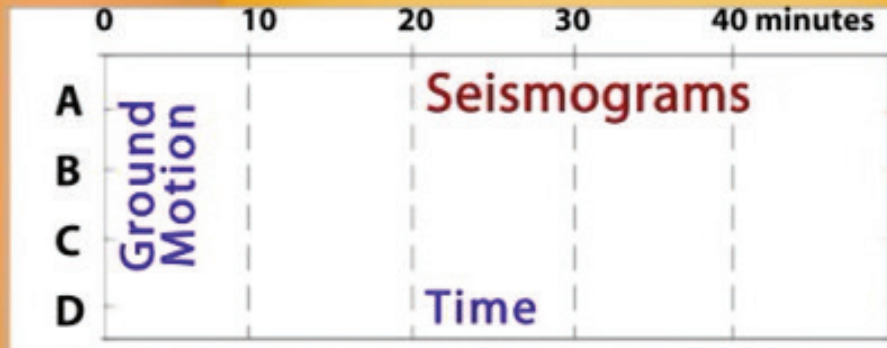
C

B

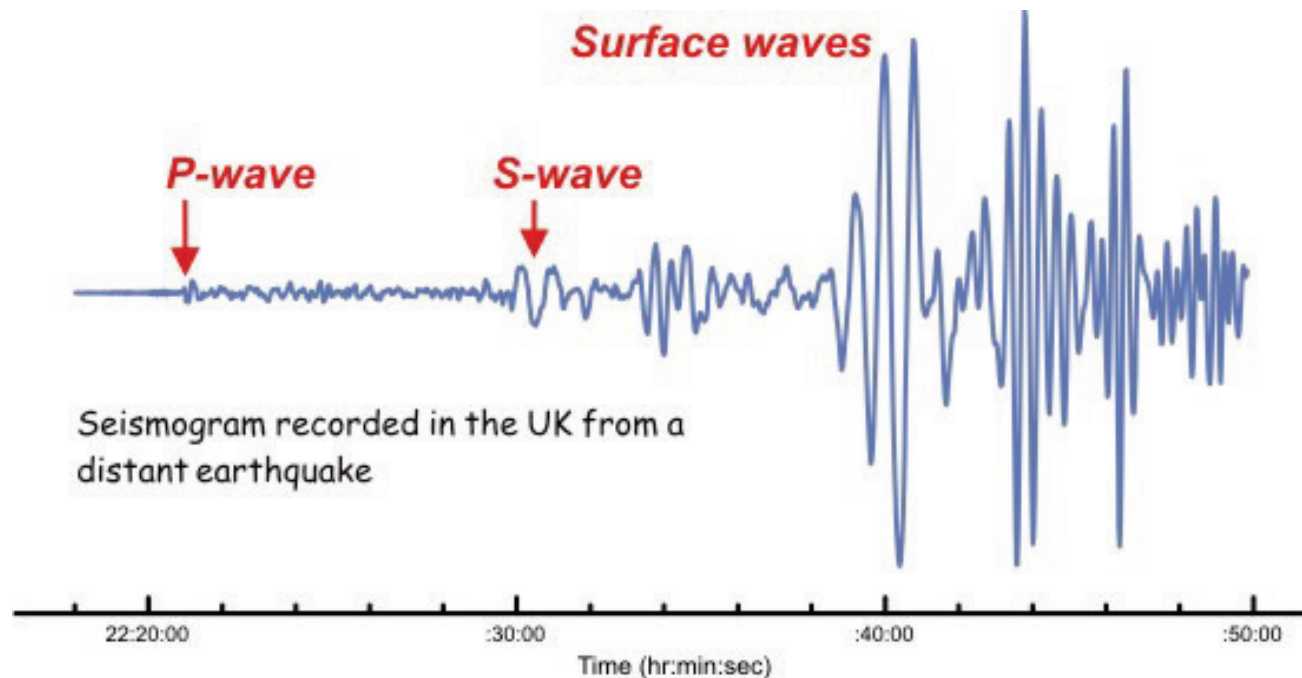
A

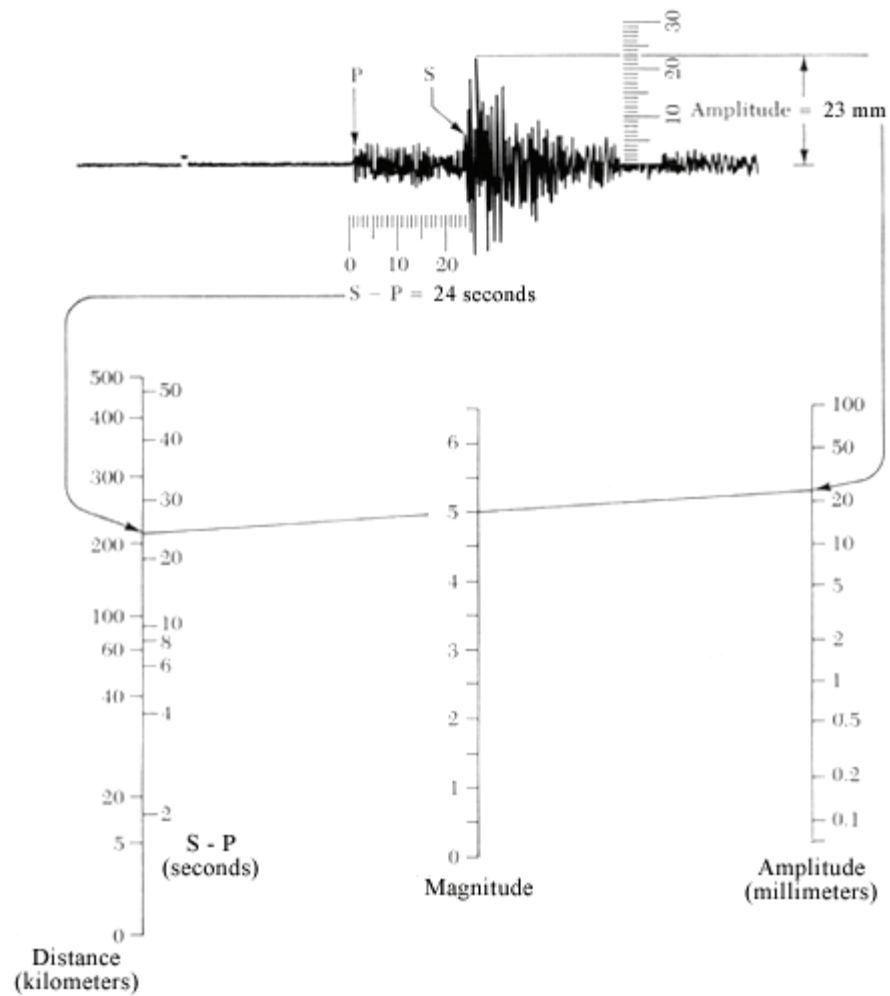
# Cartoon of P, S, & surface waves from an earthquake recorded by four widely spaced seismic stations

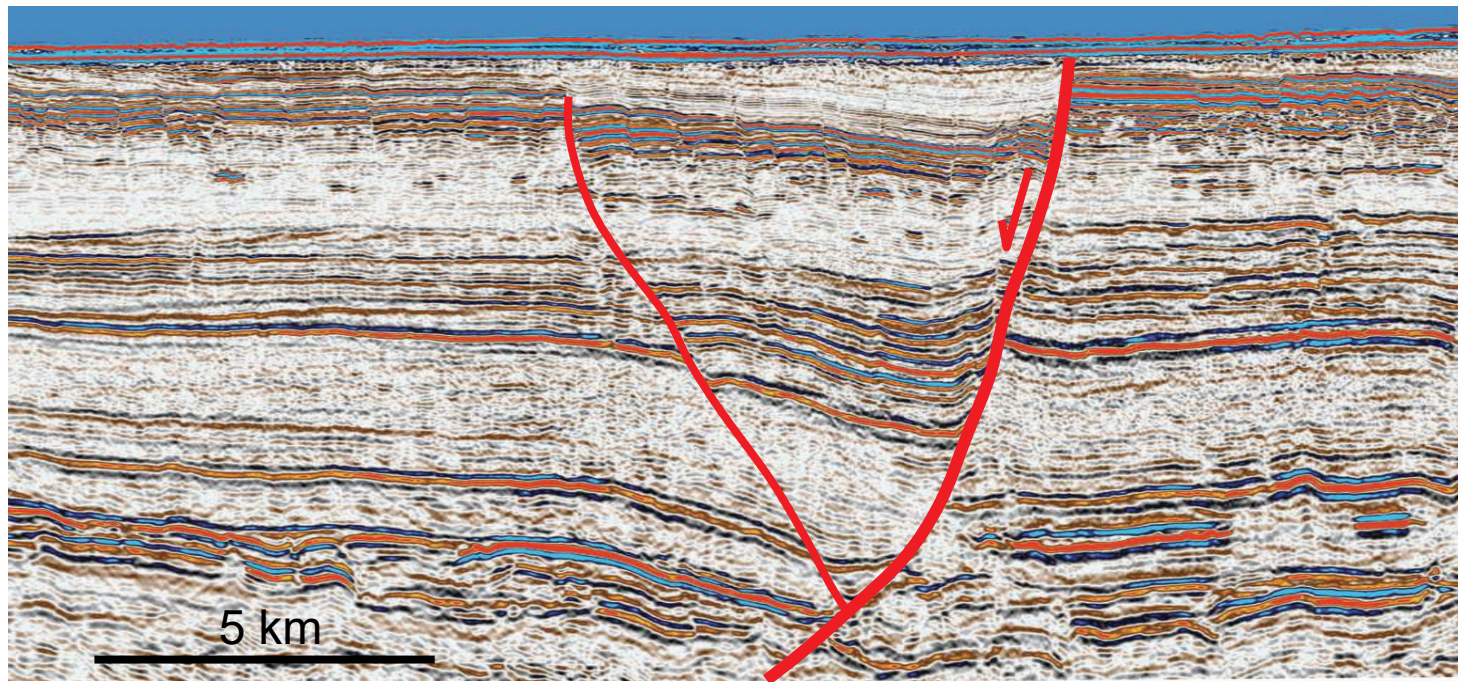
Note: in this version you will not see the seismic waves, but you will see the motion of the houses as the waves strike, as recorded on the seismograms

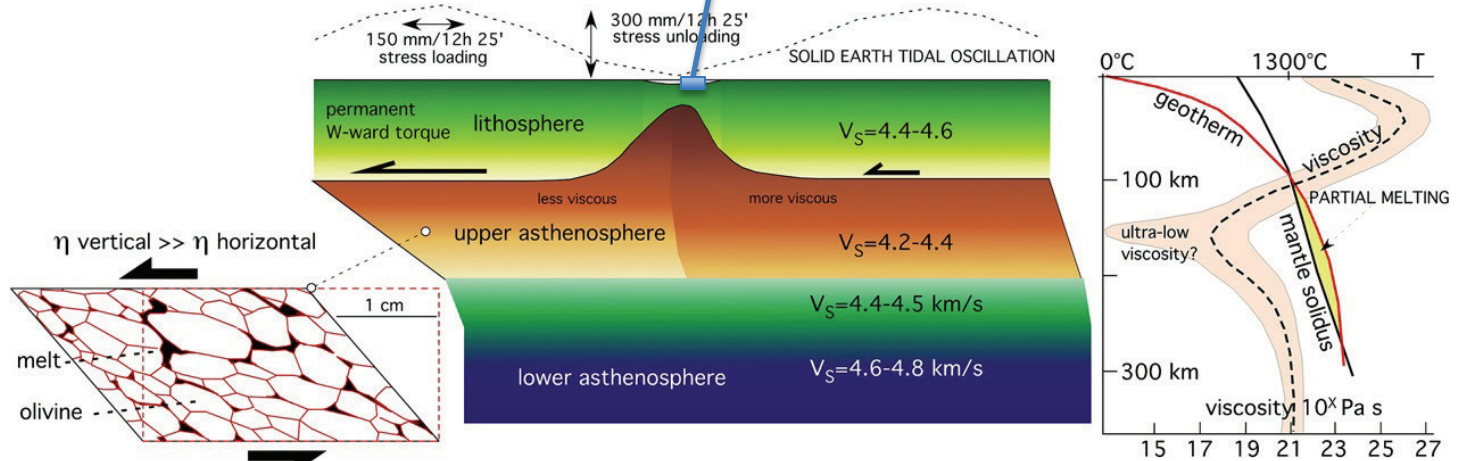


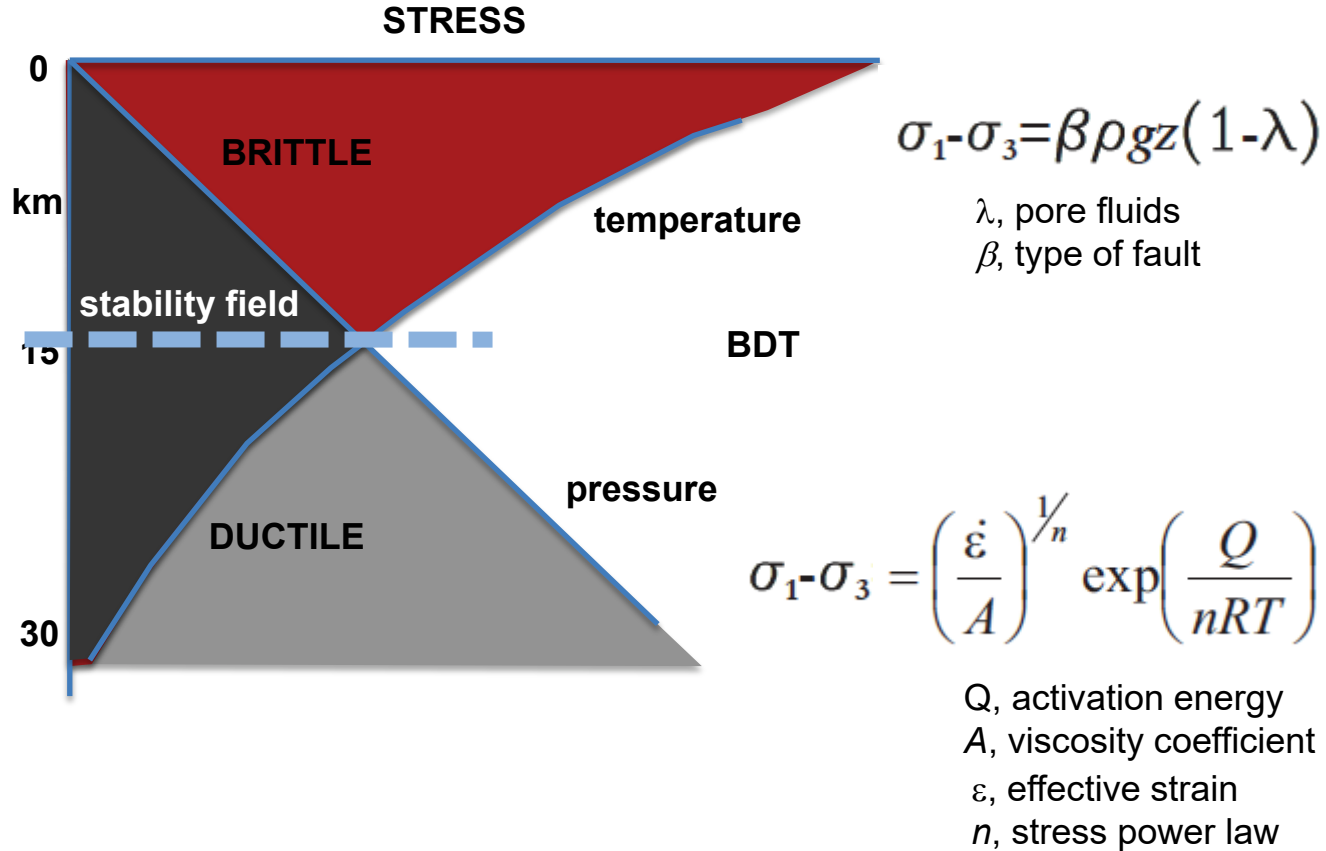
Scale exaggerated











$\beta=3$  thrust, 1.2 strike-slip, 0.75 normal fault

