Fare il geofisico - sismologo?

Tre elementi sono richiesti:

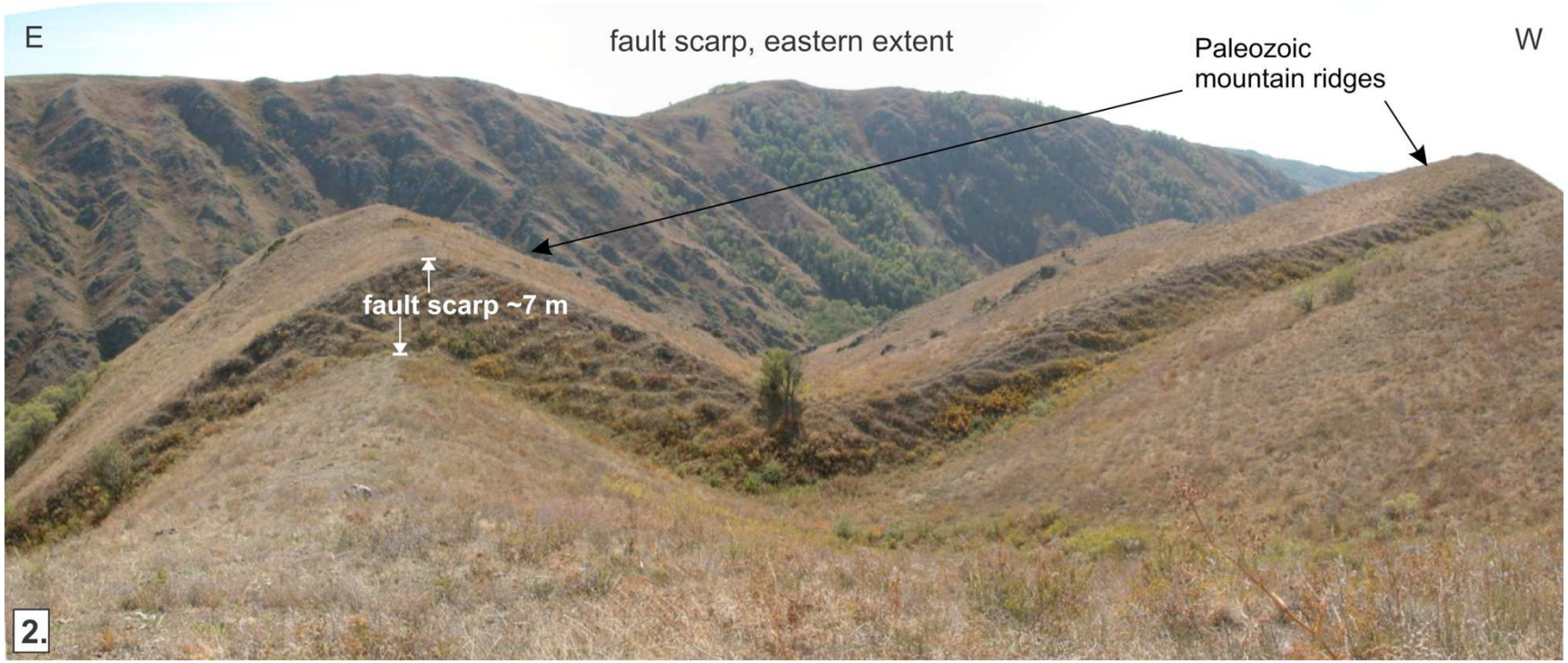
(1) $\rho \partial_t^2 u_i = f_i + \partial_j \sigma_{ij}$

(2) > ls *.out

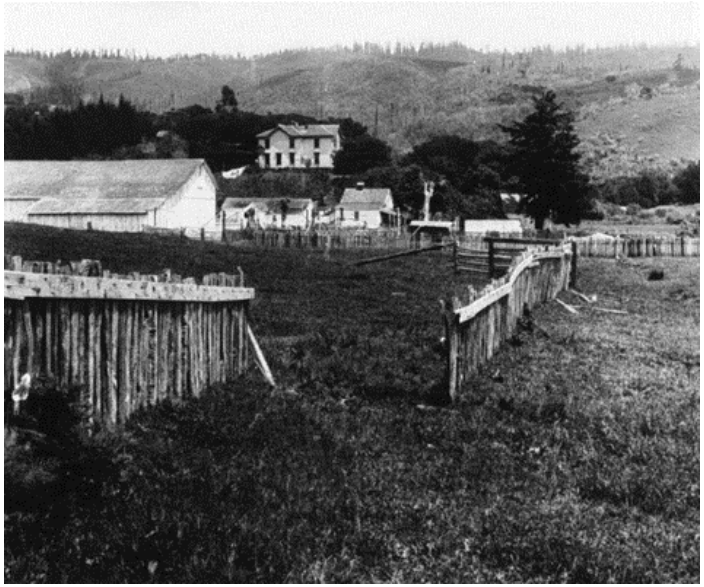
(3) Facies

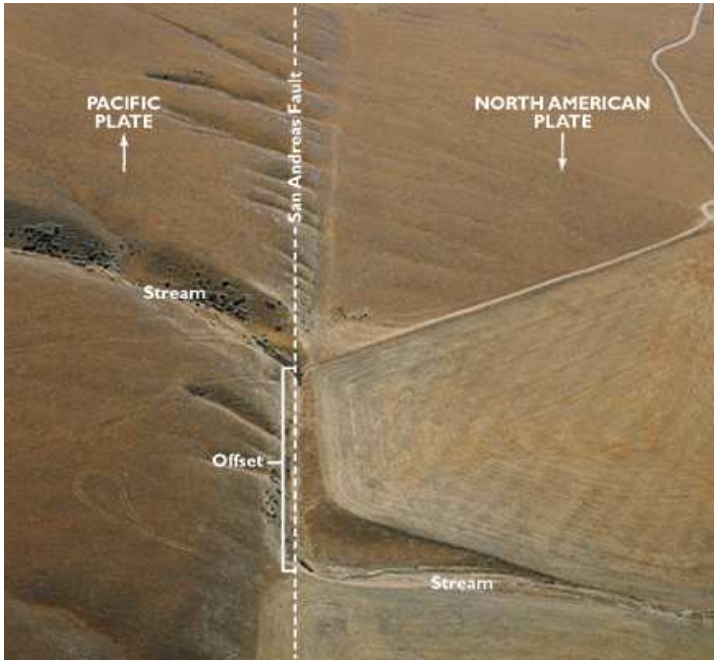
North Africa
El Asnam, 1980
M 7.4

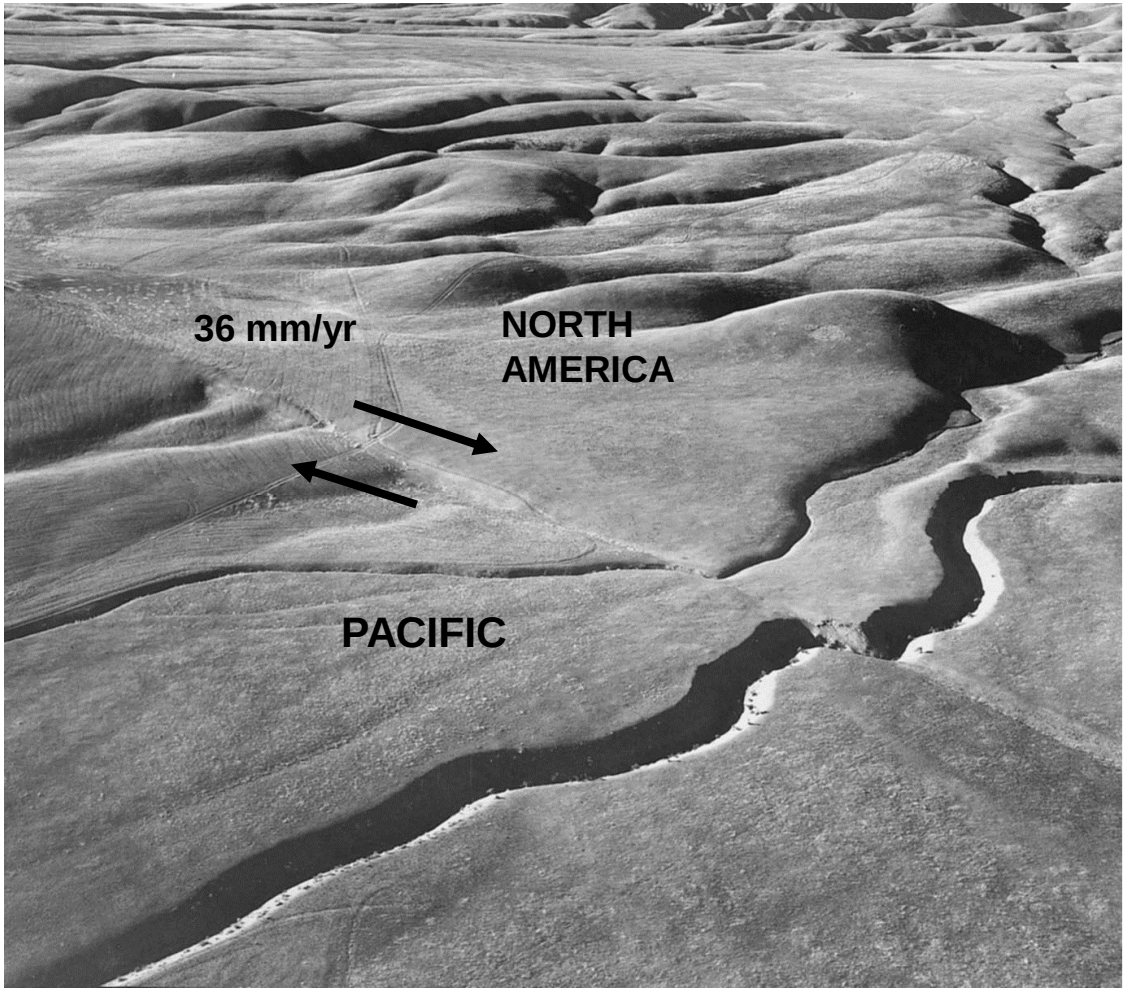
Central Asia

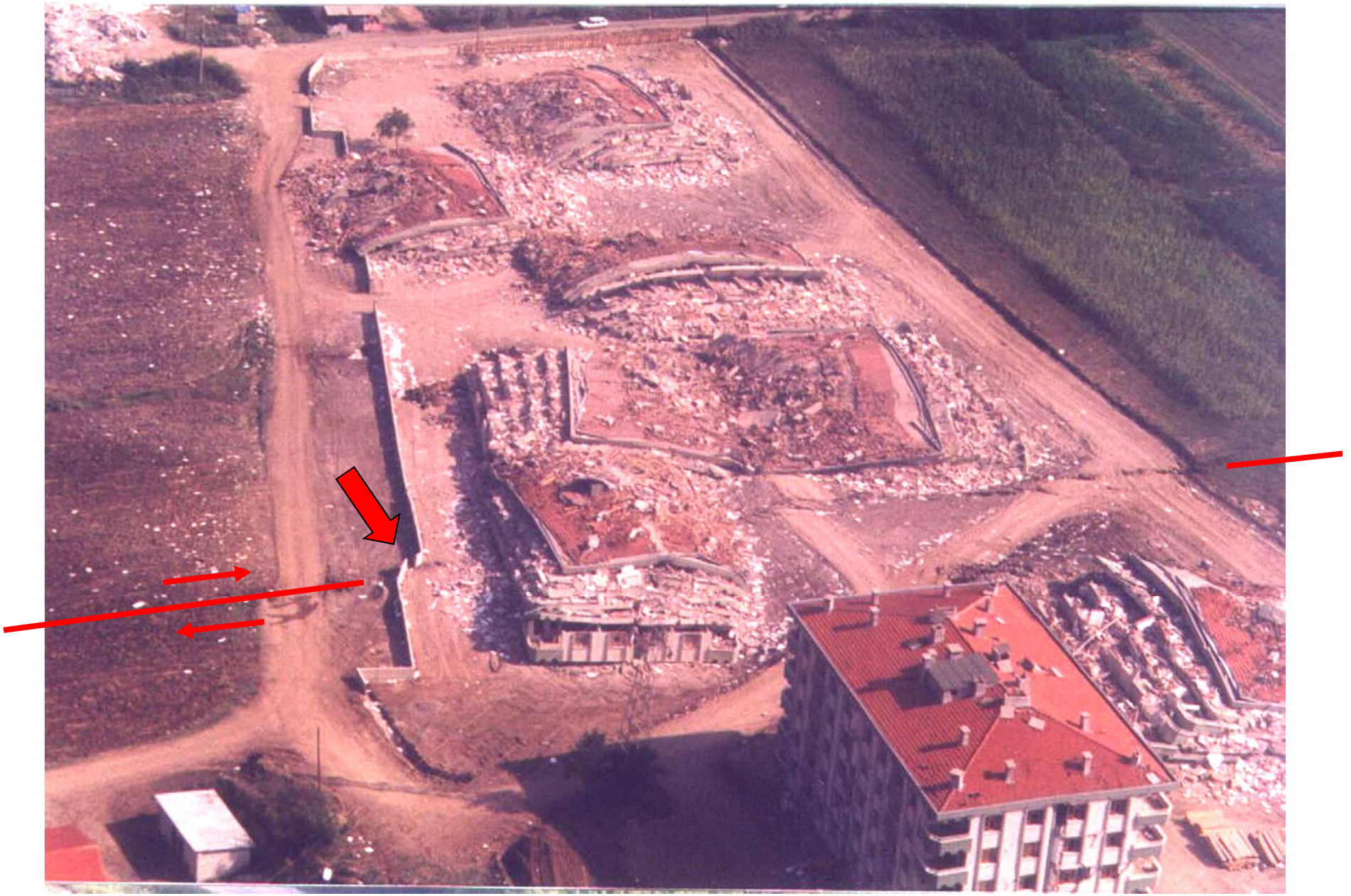


esempio della faglia di San Andreas e il terremoto di San Francisco

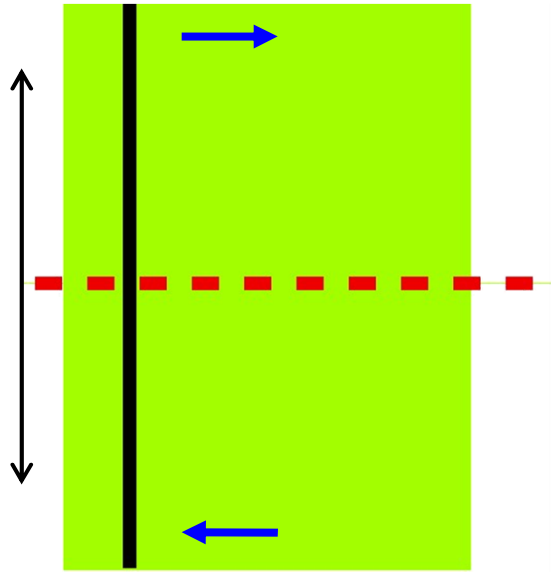




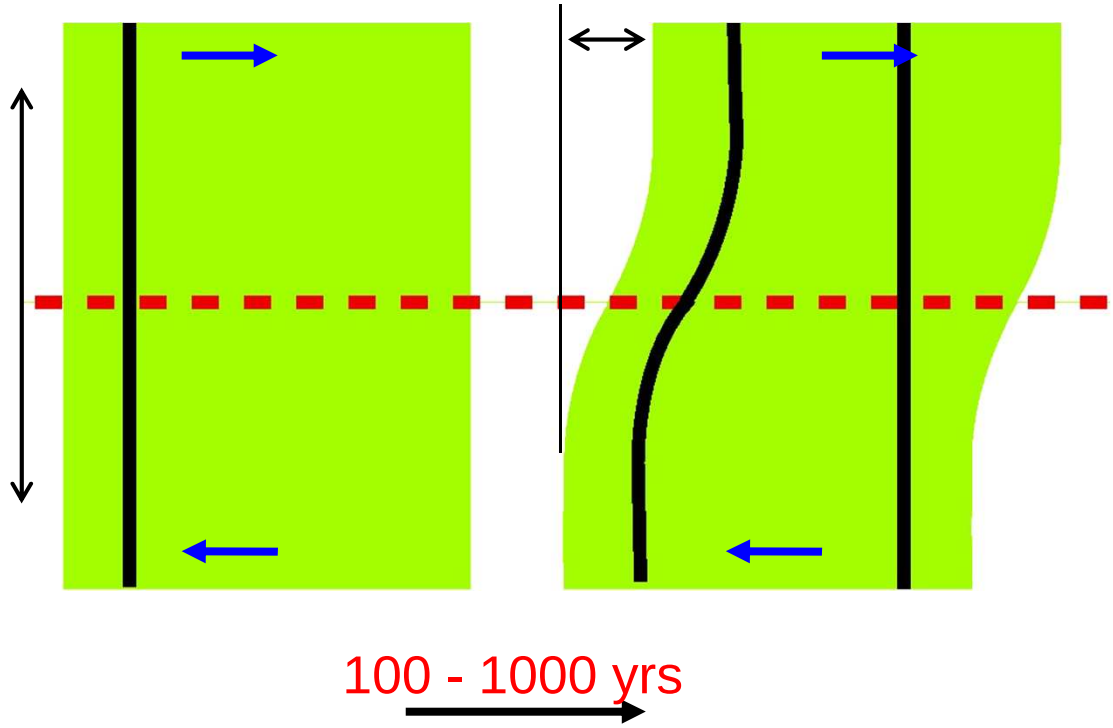




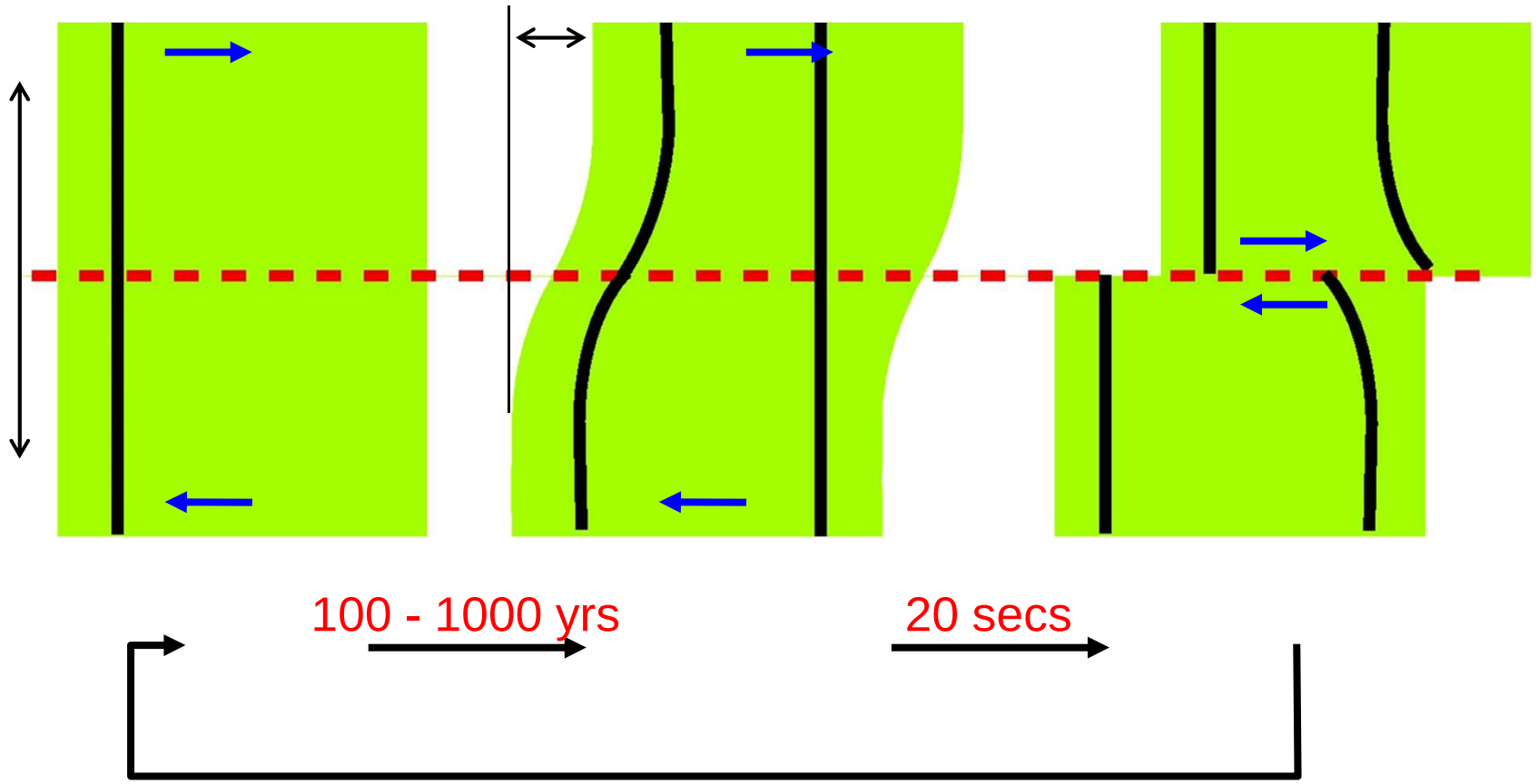
Fault scale:
The Earthquake Cycle

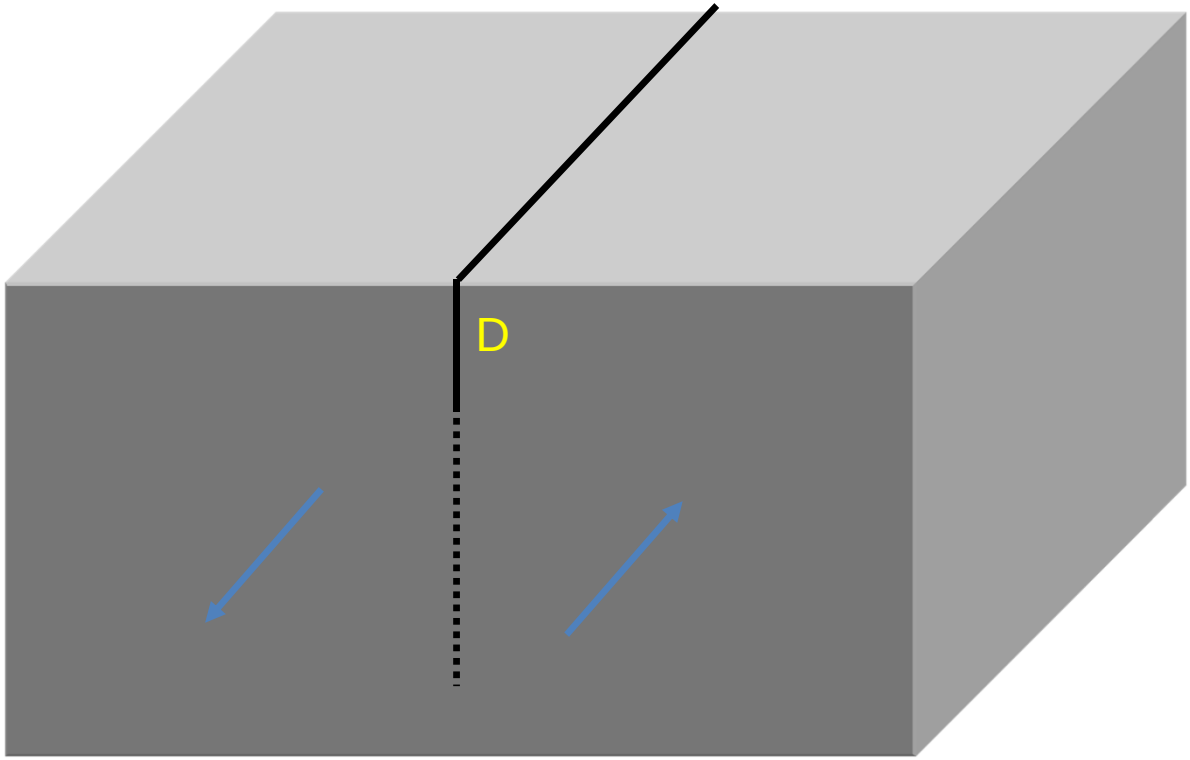


The Earthquake Cycle

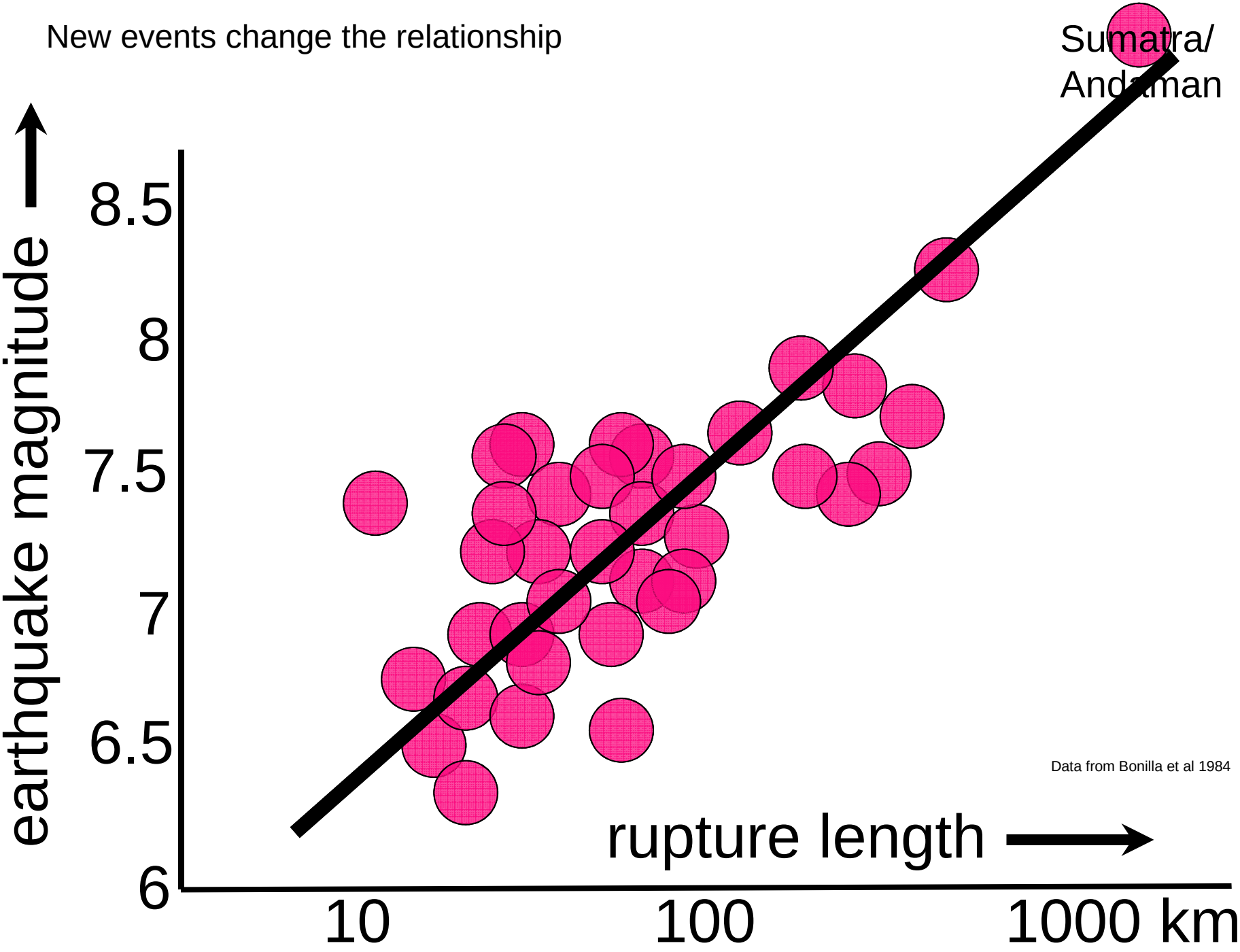


The Earthquake Cycle

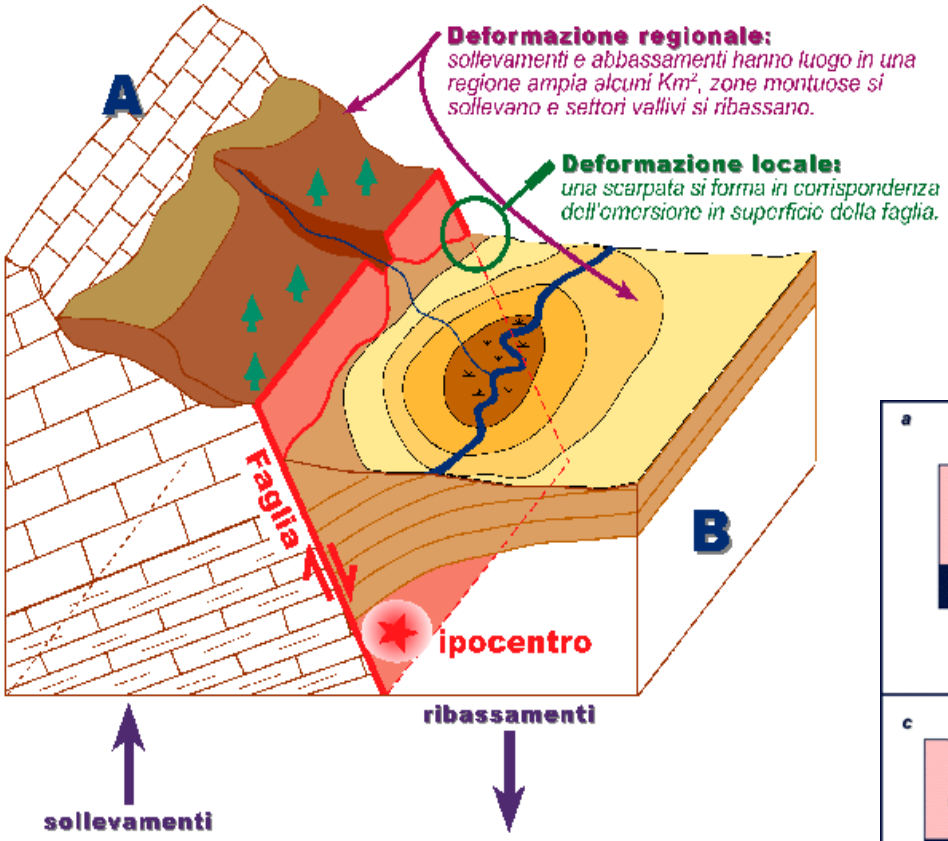


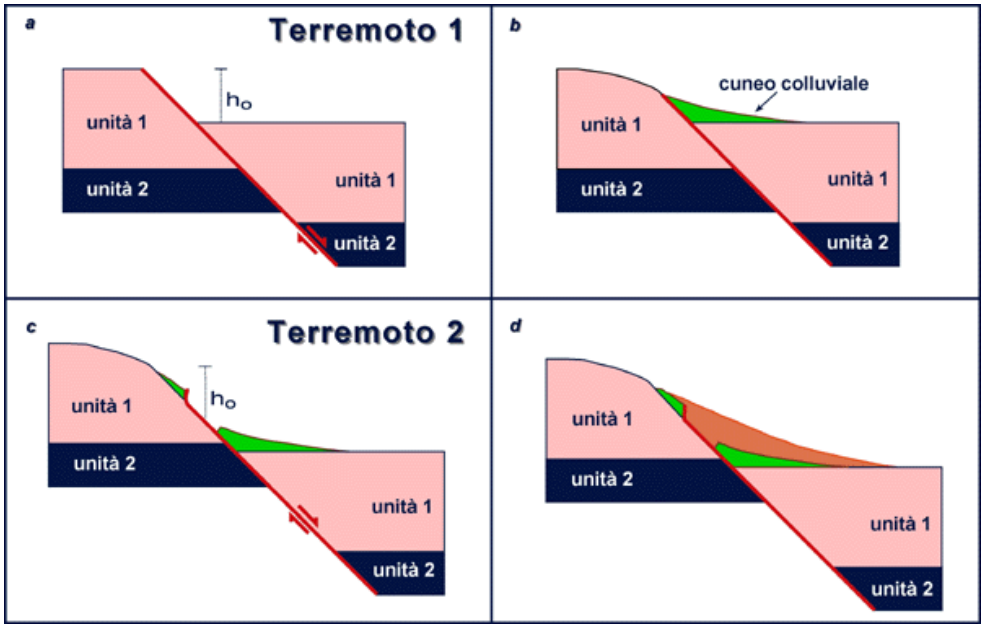

D

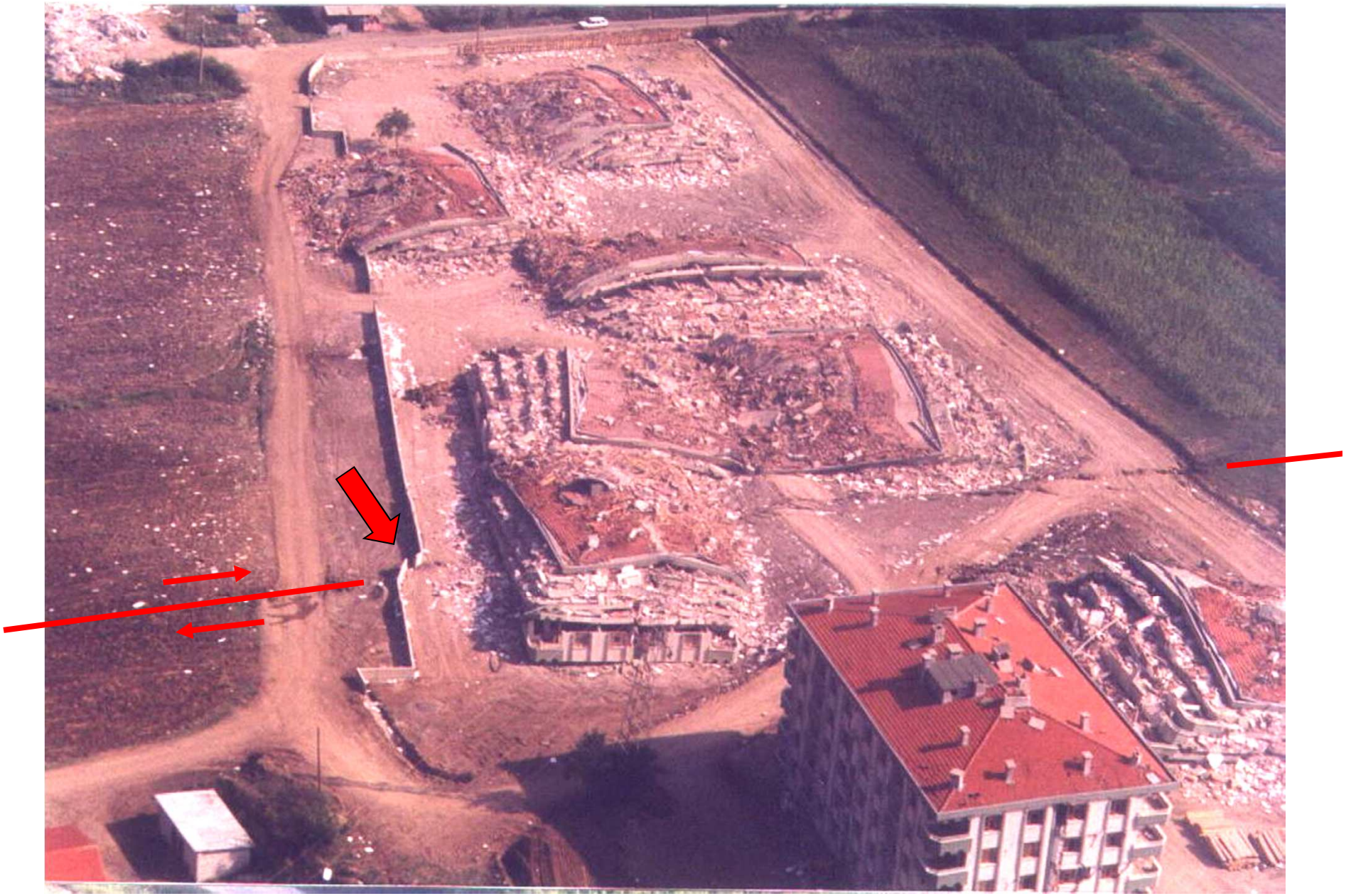
New events change the relationship

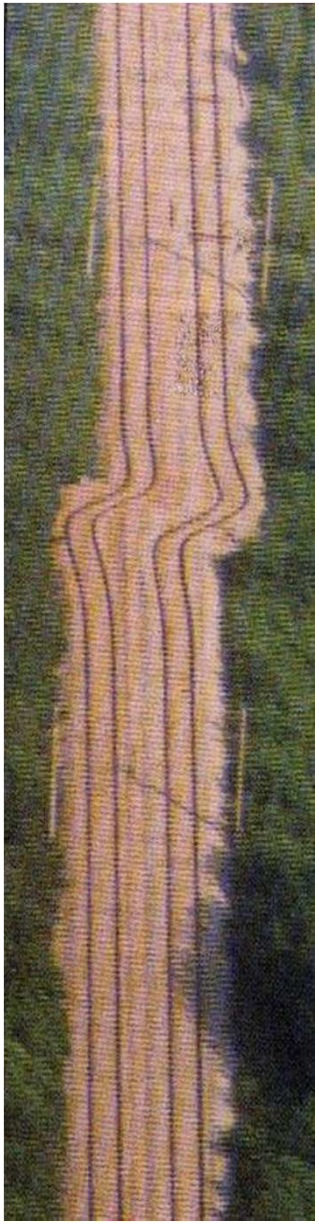


Processi alla Faglia che genera terremoti

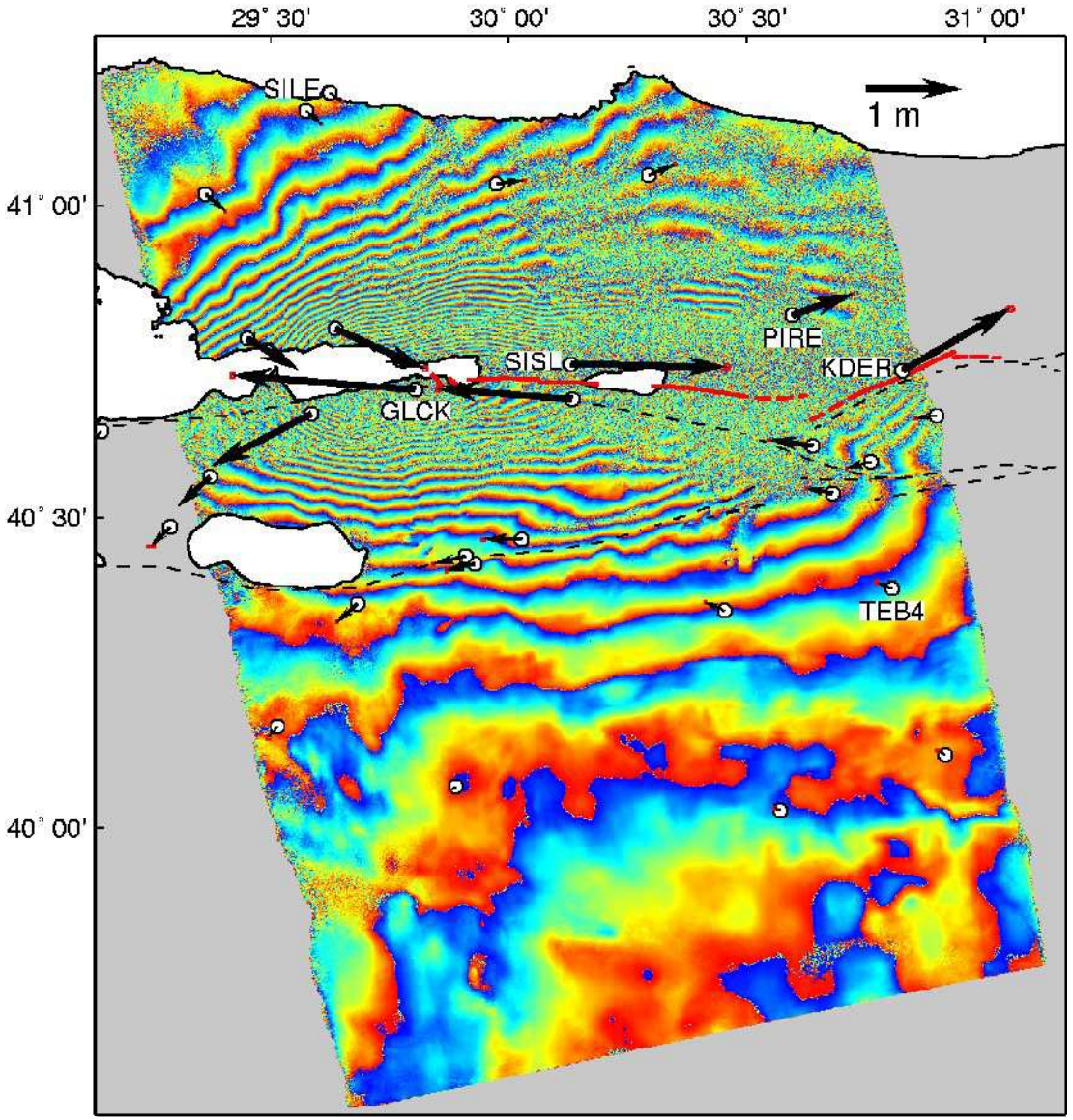




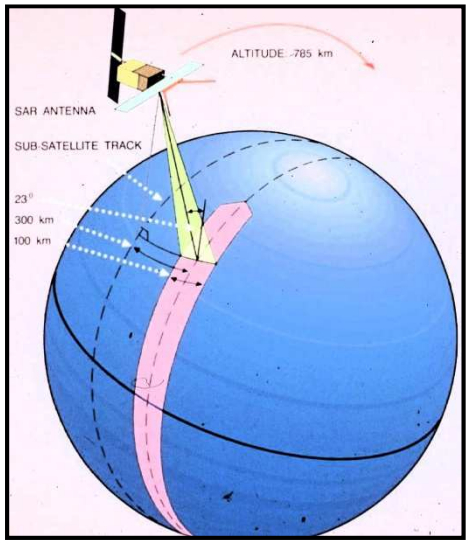


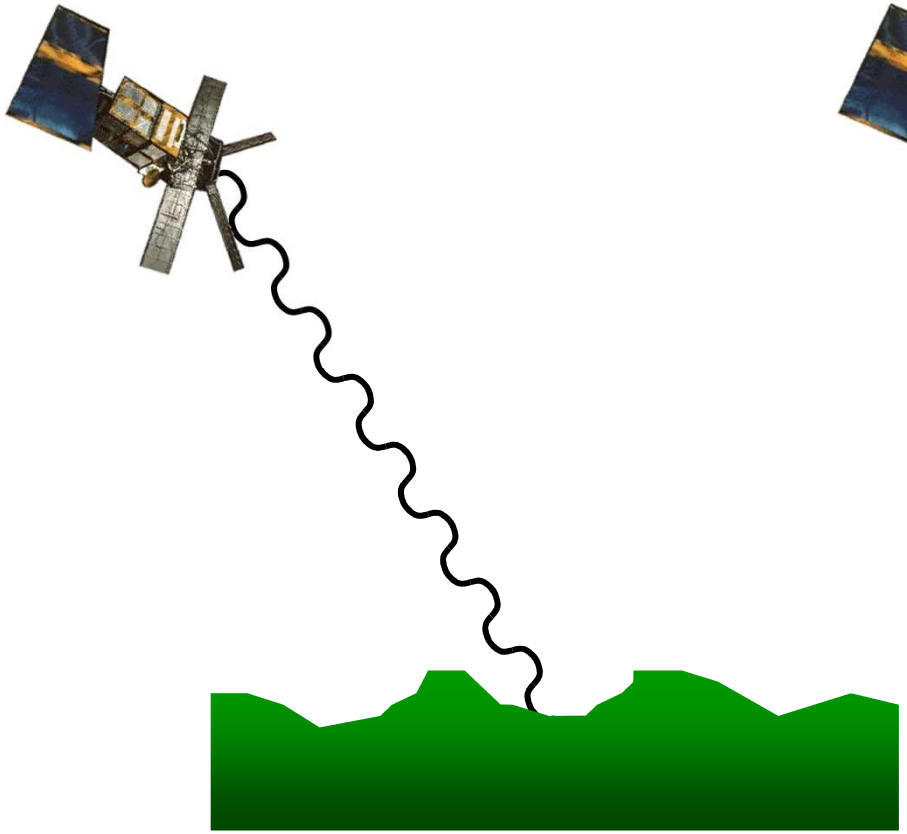


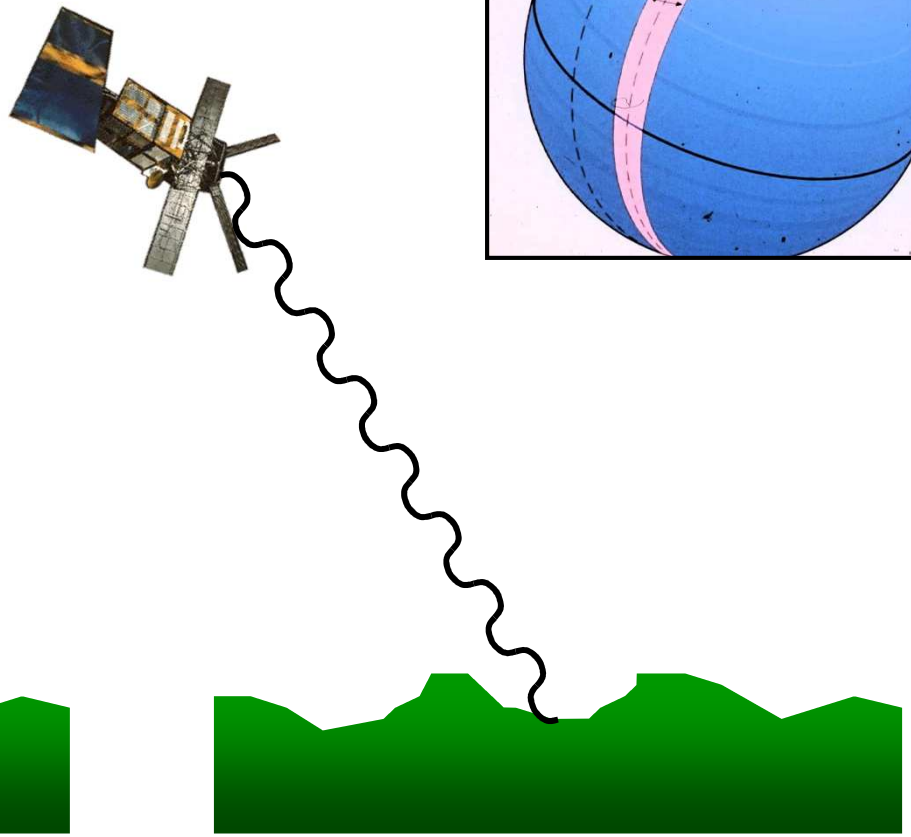
The Izmit earthquake displacement field



InSAR – how it works







InSAR – how it works

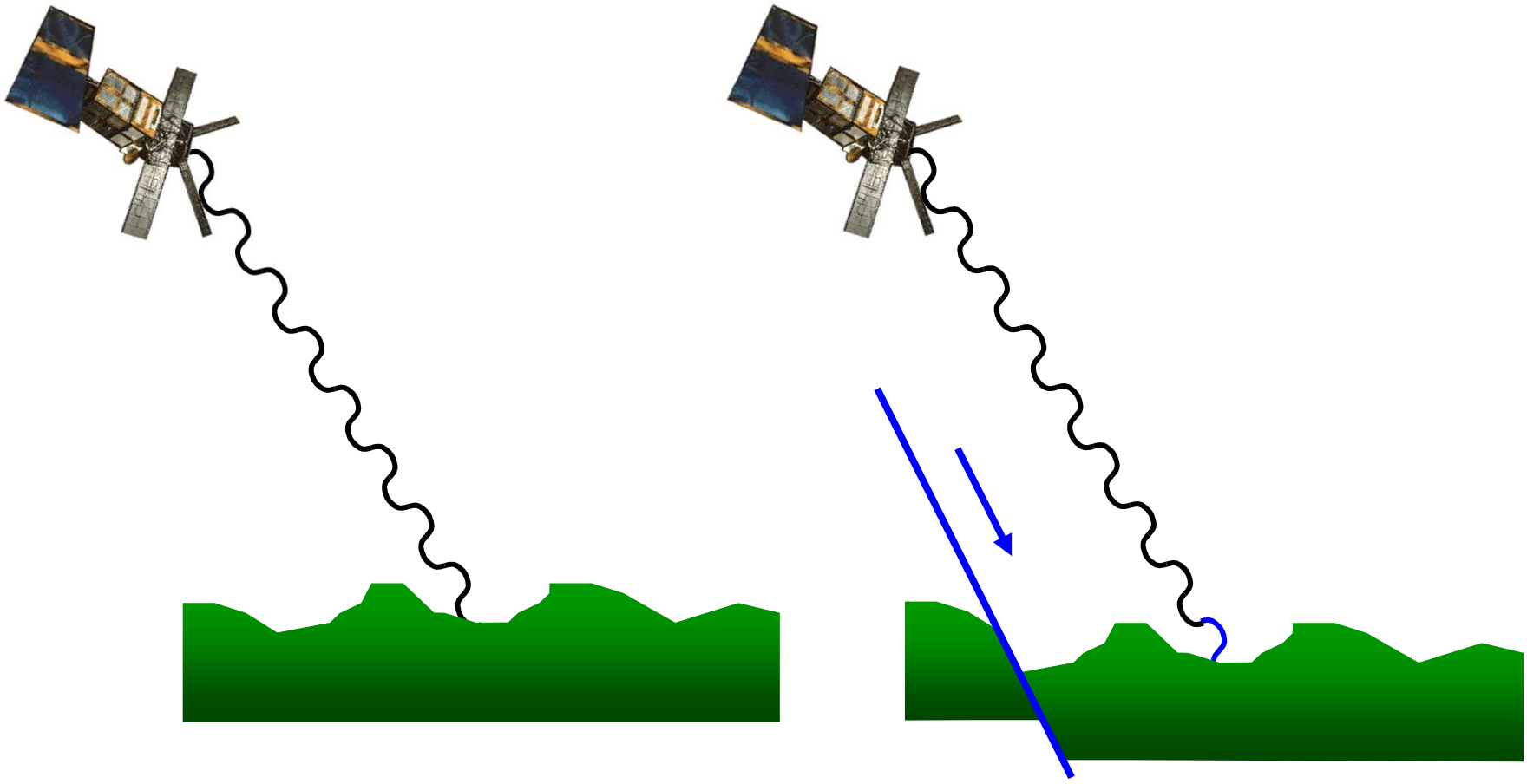
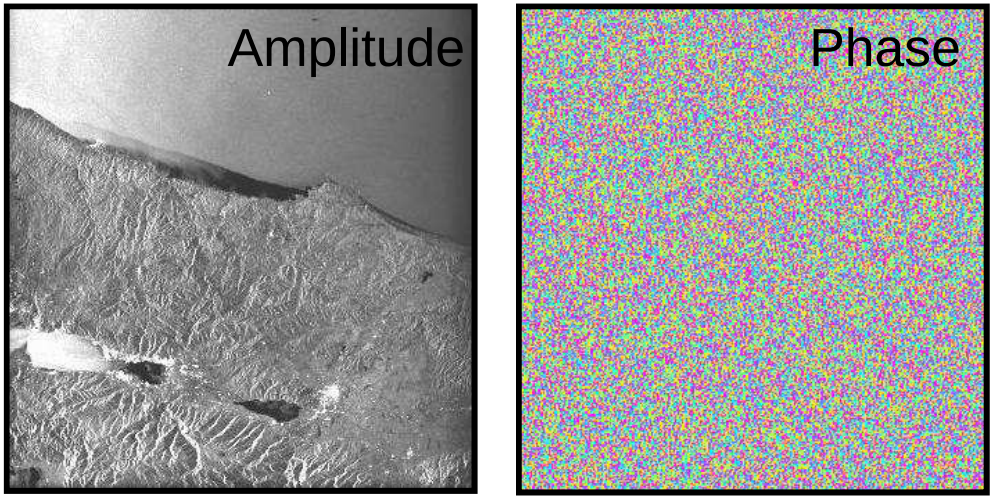


Image A - 12 August 1999



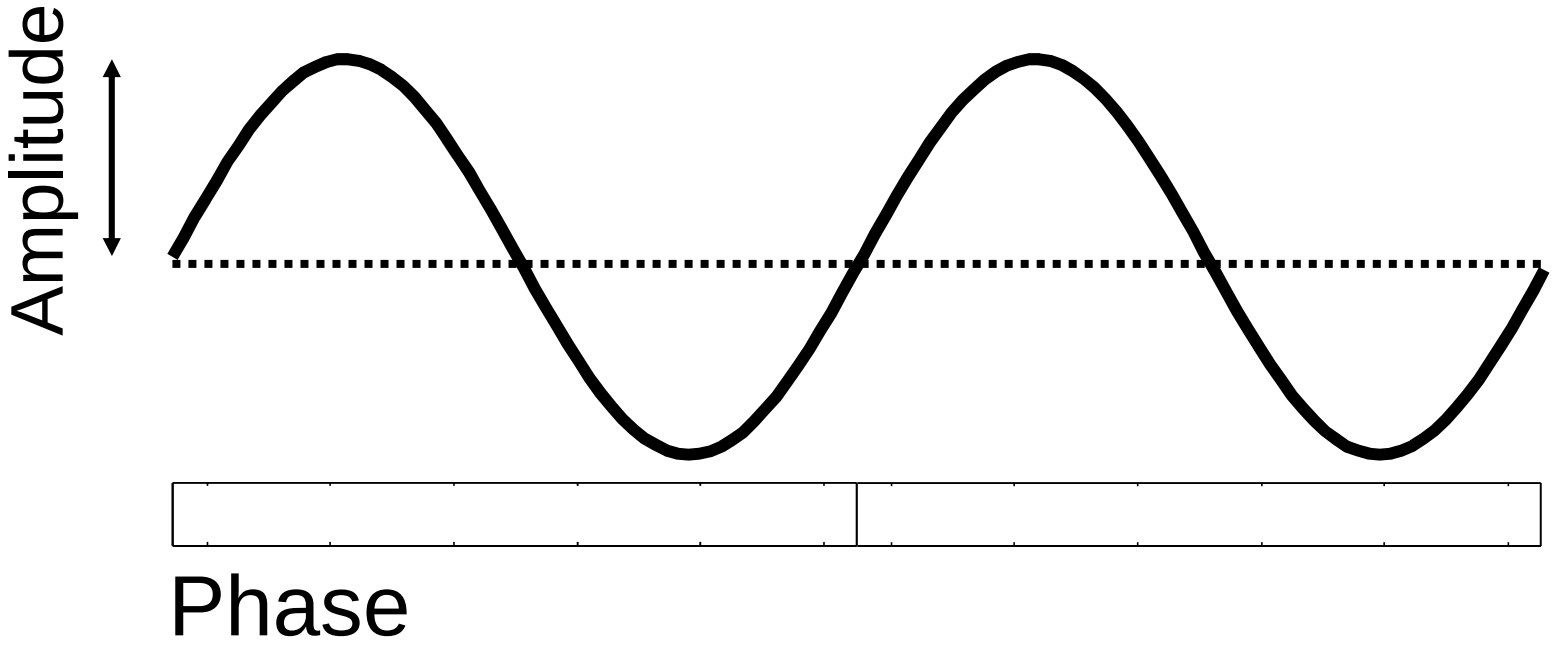
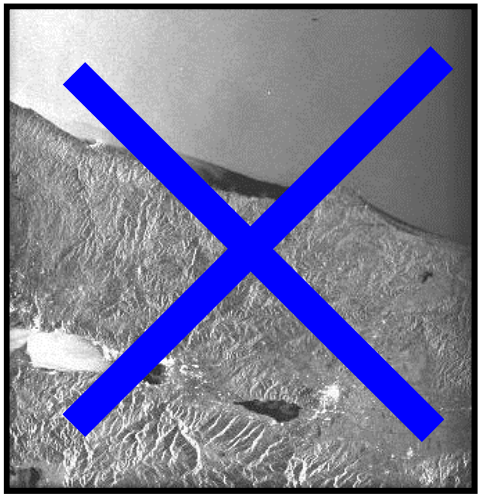
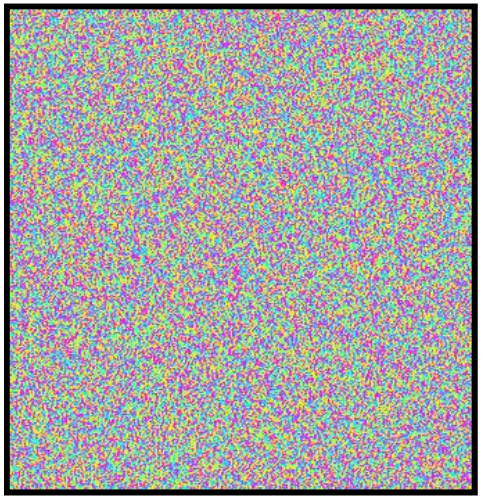
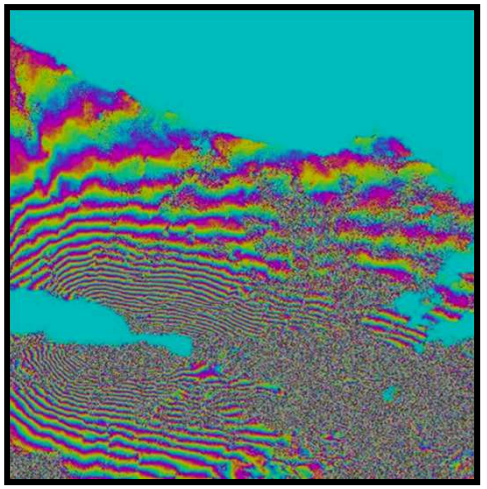


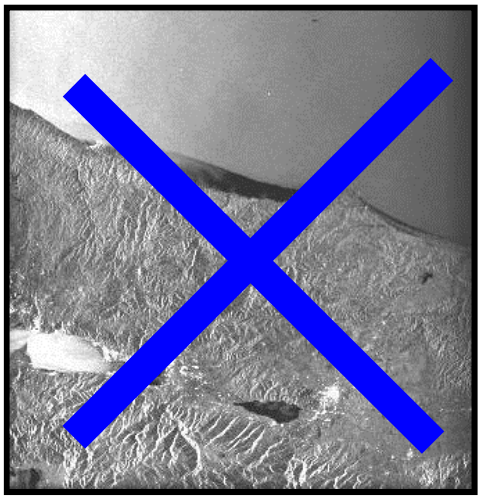
Image A - 12 August 1999

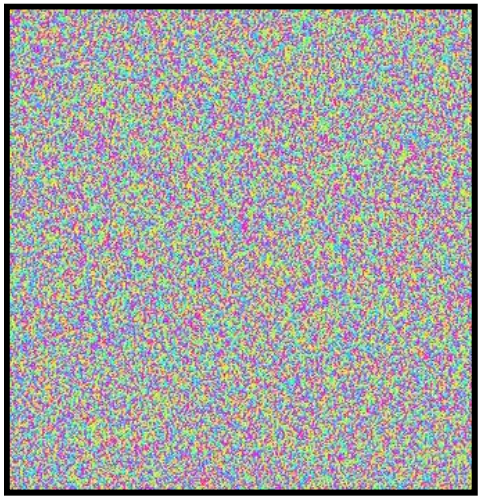




Interferogram =
Phase A - Phase B

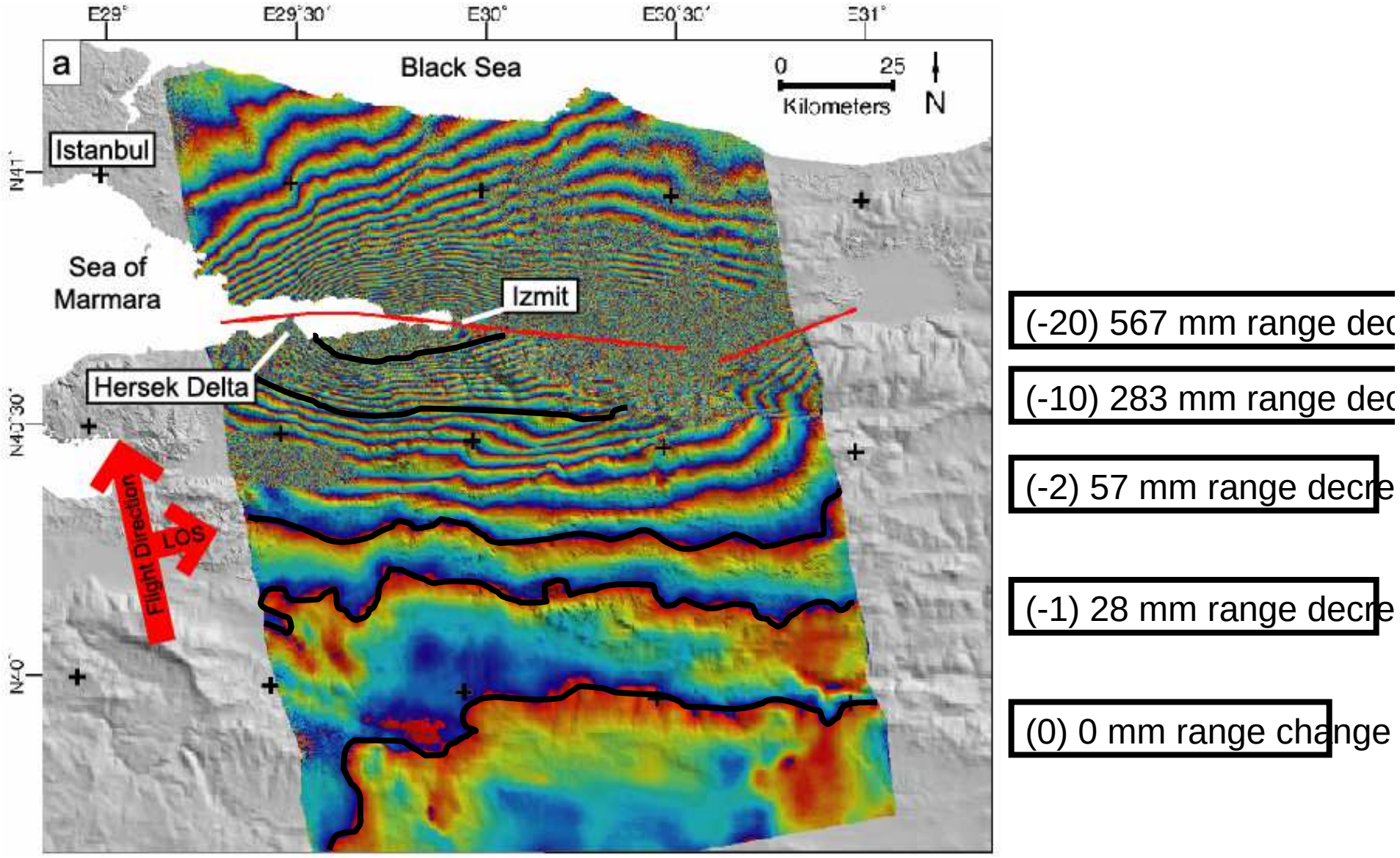




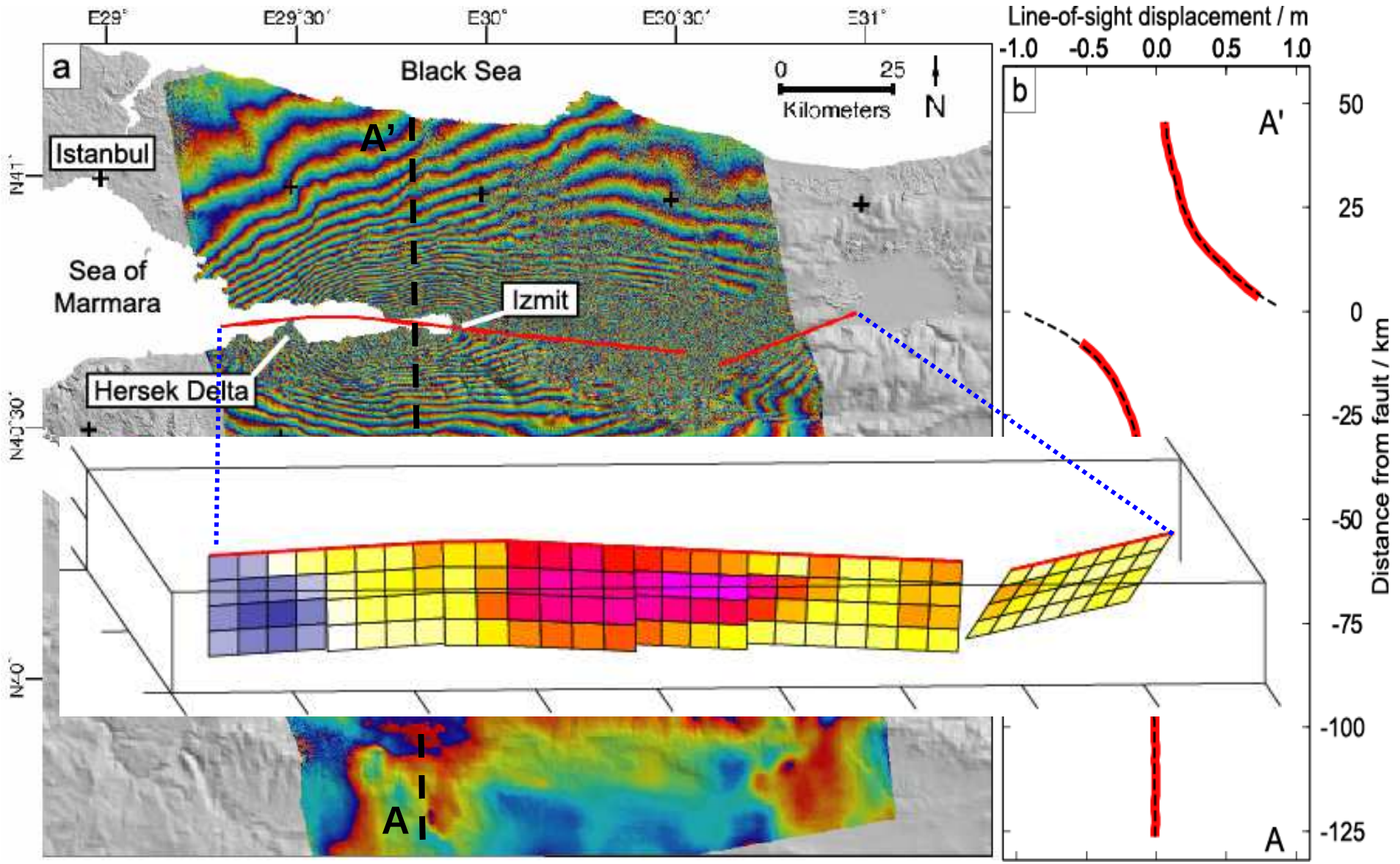


Remove phase from
topography
satellite positions
earth curvature

Image B - 16 September 1999

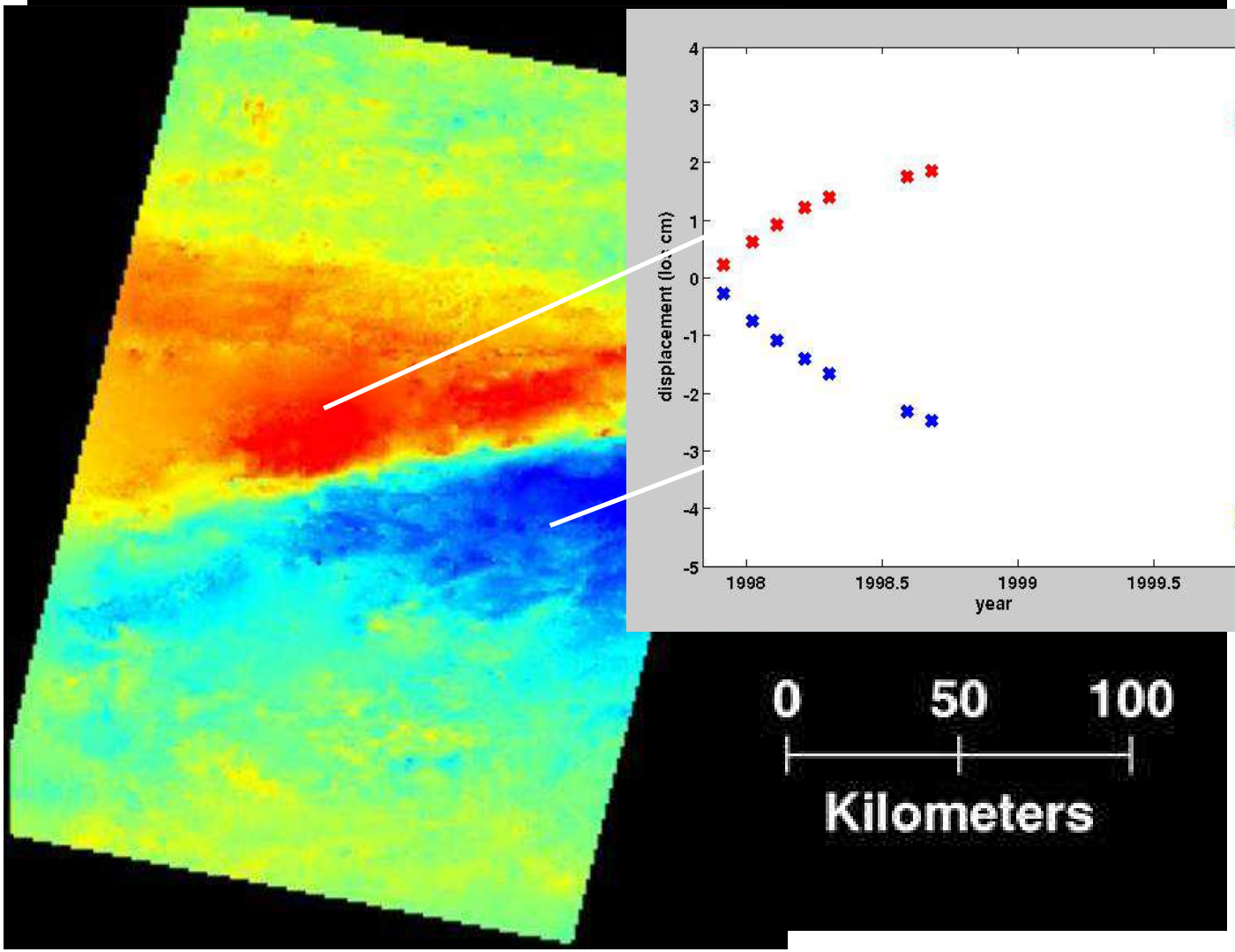


17 August 1999, Izmit earthquake (Turkey)

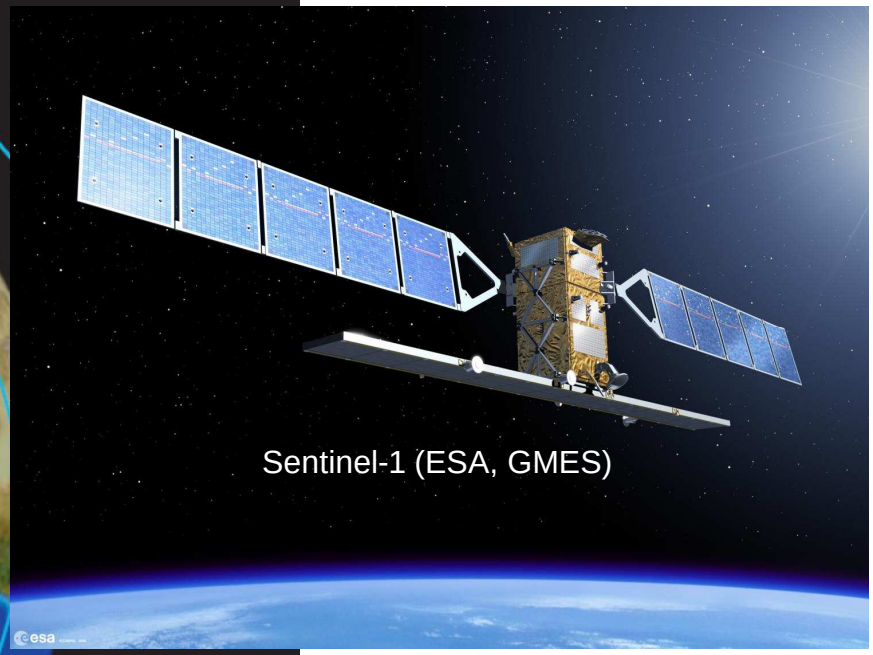


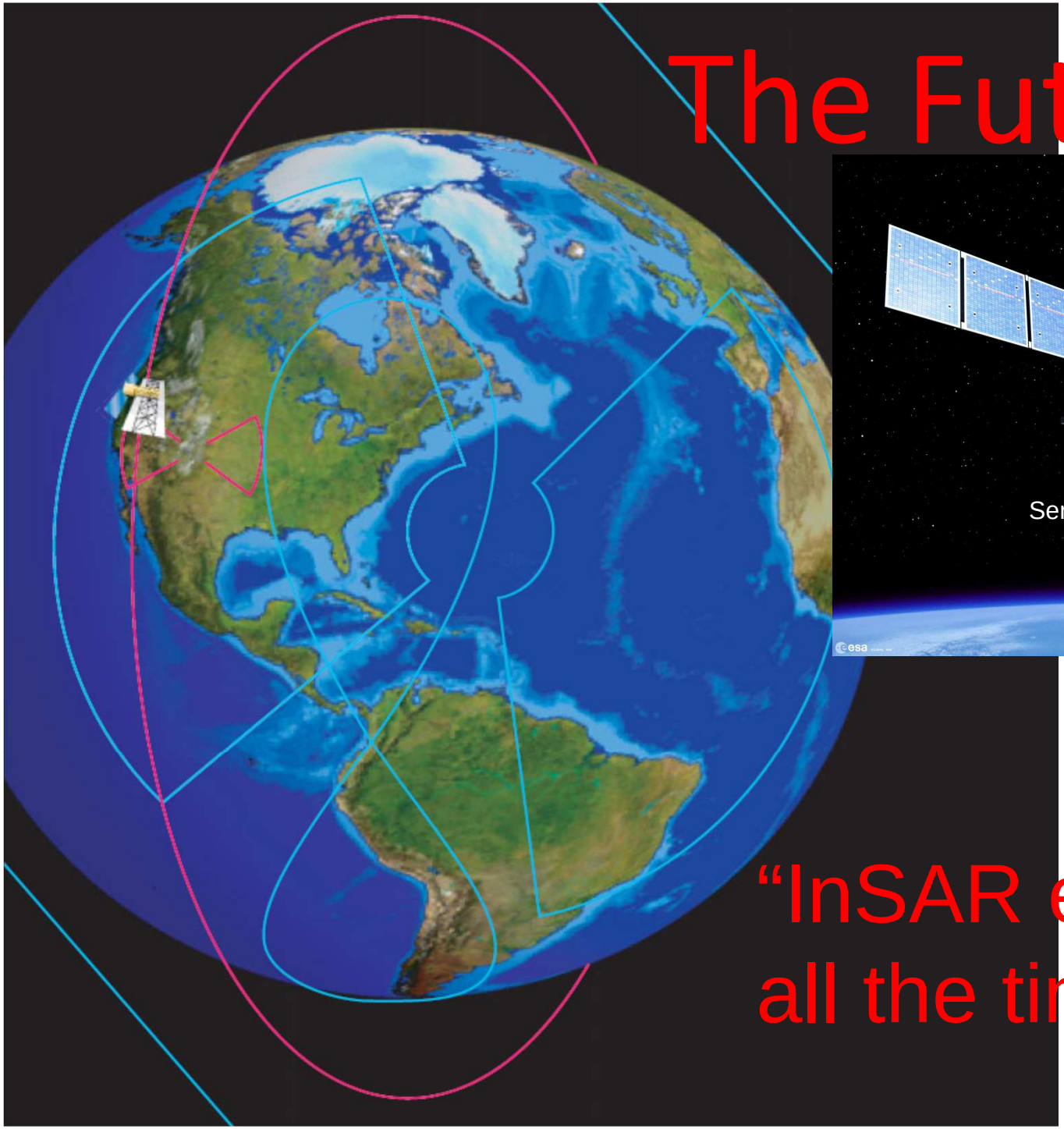
17 August 1999, Izmit earthquake (Turkey)

Post seismic deformation – the 1997 Manyi Earthquake, Tibet



The Future





"InSAR everywhere, all the time"

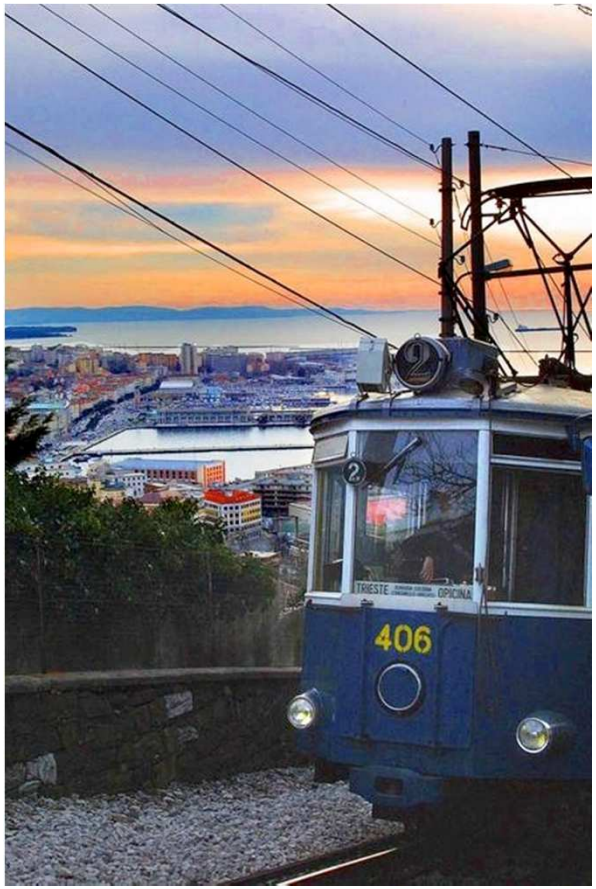
The alternative to satellite monitoring

Cosa unisce Trieste e San Francisco?

Cable Car
San Francisco

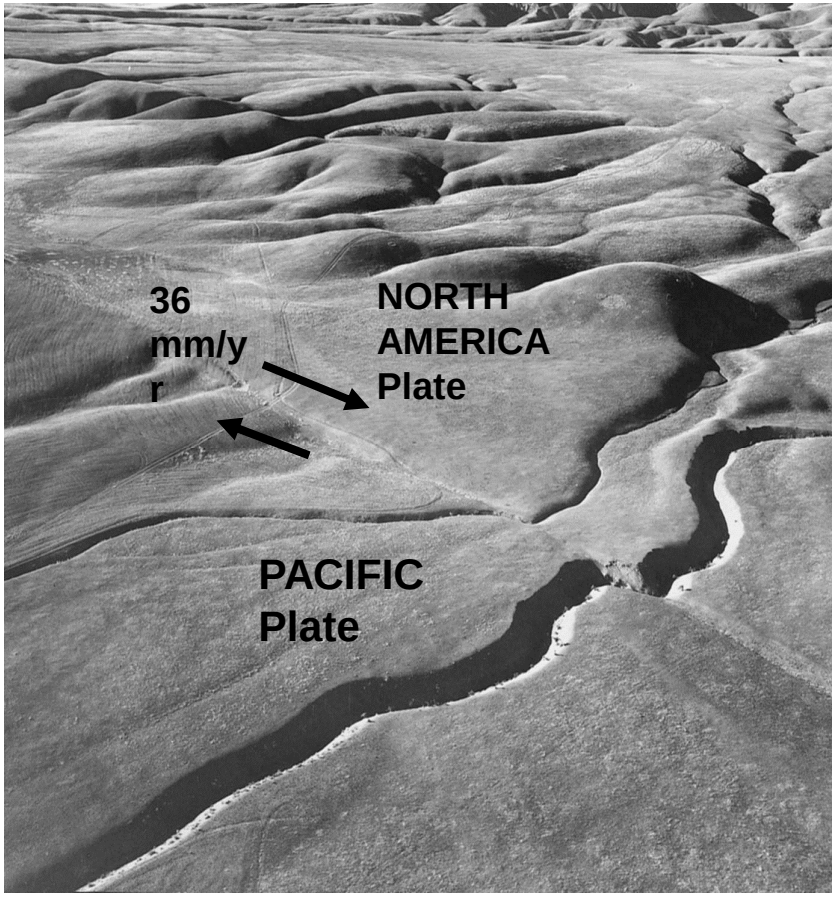
Photo by Phillip Coblentz

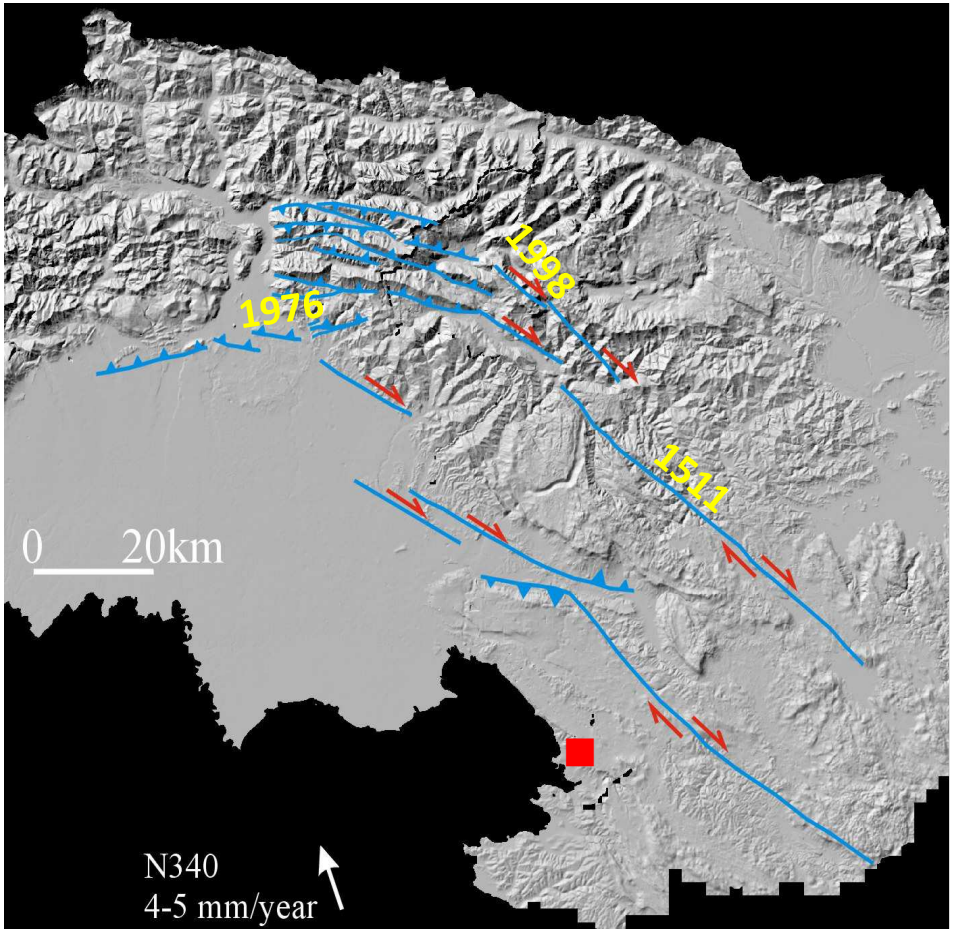
Tram de Opcina



Pubblicato da Il Piccolo

dalla San-Andreas in California alle faglie dietro casa..



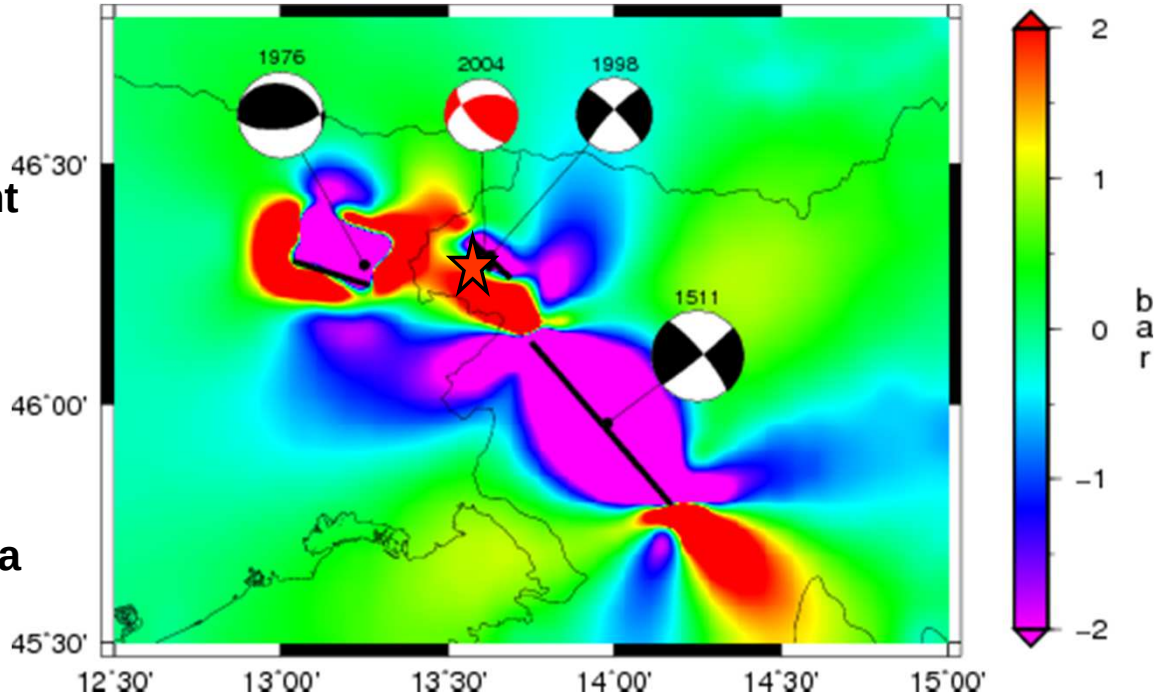


Visco-elastic modeling and stress evolution since 1511 up to 2004 accounting for coseismic and postseismic deformation

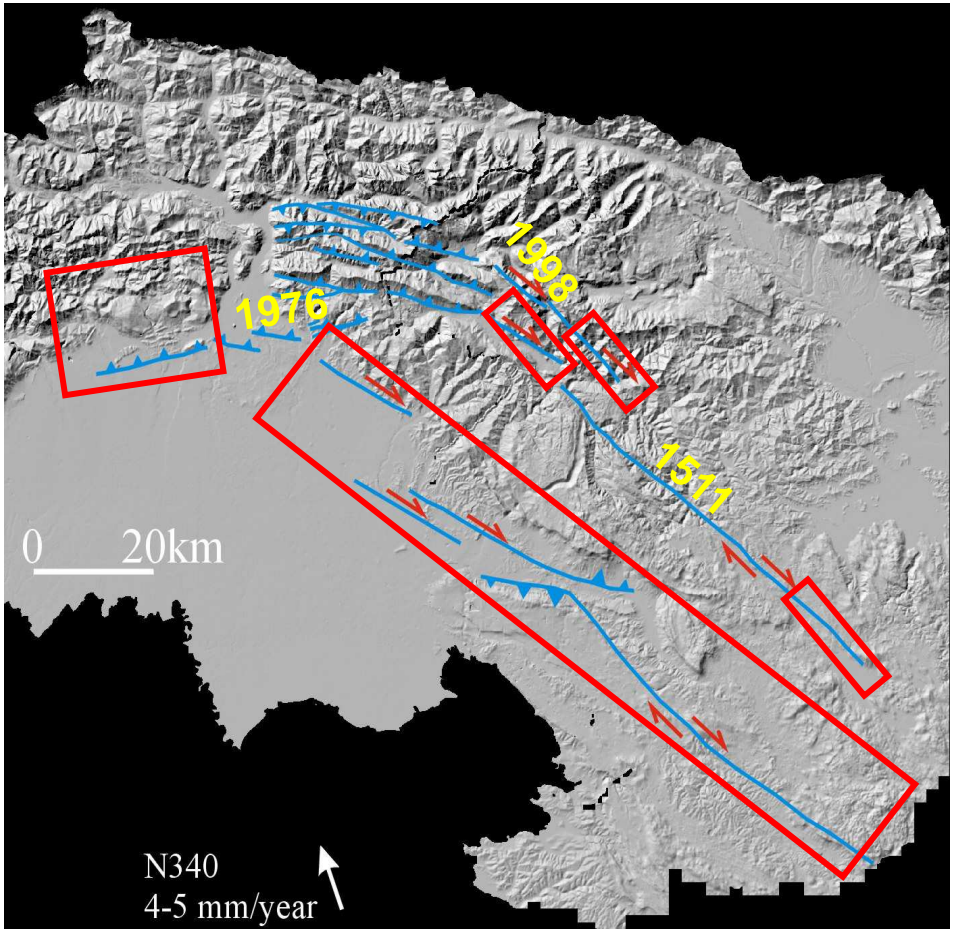
of each past major event

Borghi, Aoudia, Riva, Barzaghi- *Tectonophysics*, 2009

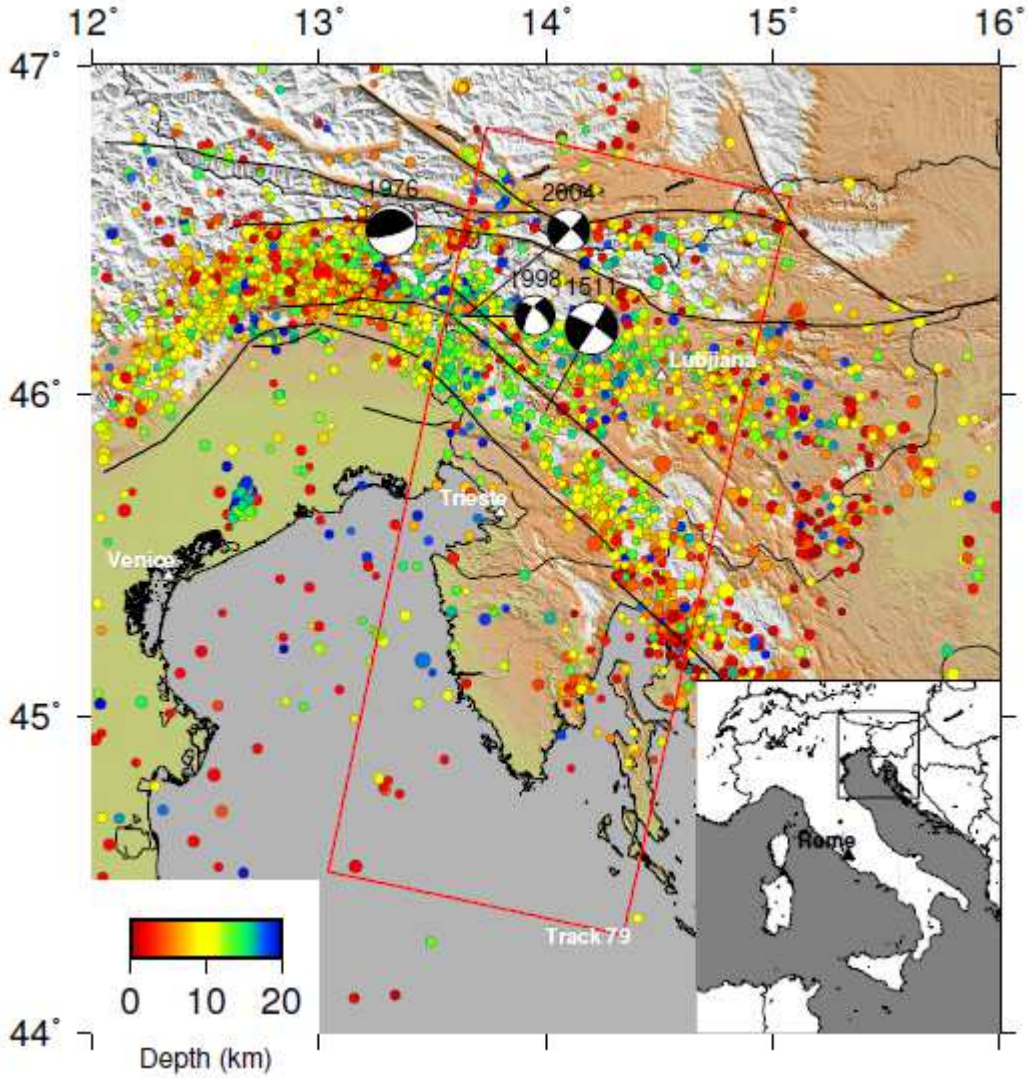
- **3-D Finite Elements Method**
- **domain boundaries extending 100 km away from the most external point of each fault**
- **an Earth model comprised by a 16-km-thick elastic upper curst, a viscoelastic lower crust with viscosity 10^{19} Pa s between a depth of 16 km and the Moho at 37 km and a viscoelastic lithospheric mantle with viscosity 10^{21} Pa s.**

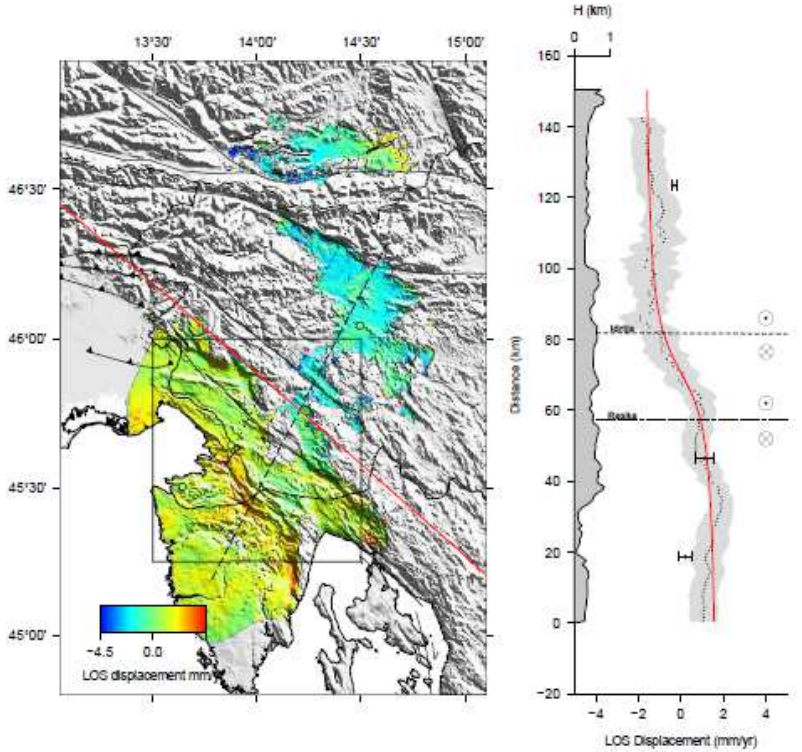


Le strutture che richiedono piu attenzione

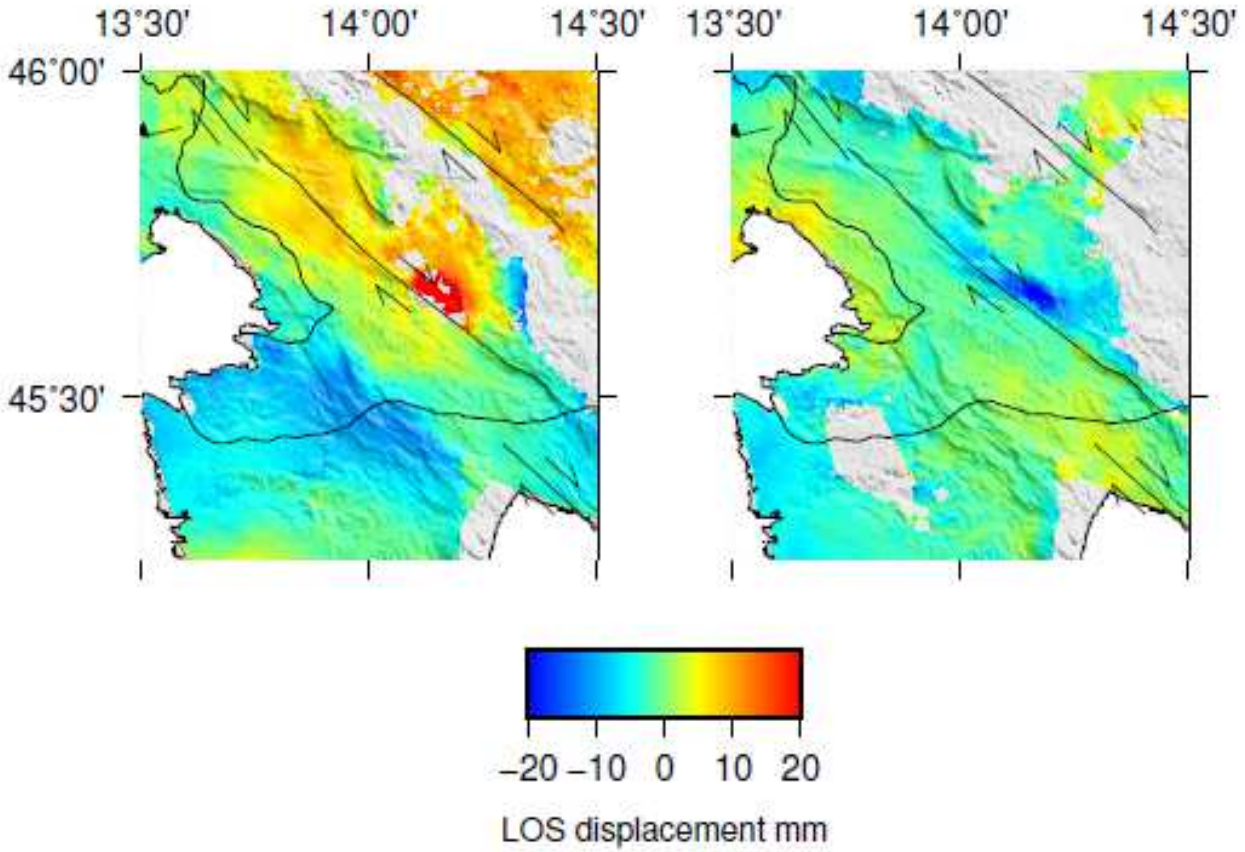


close to your home place..

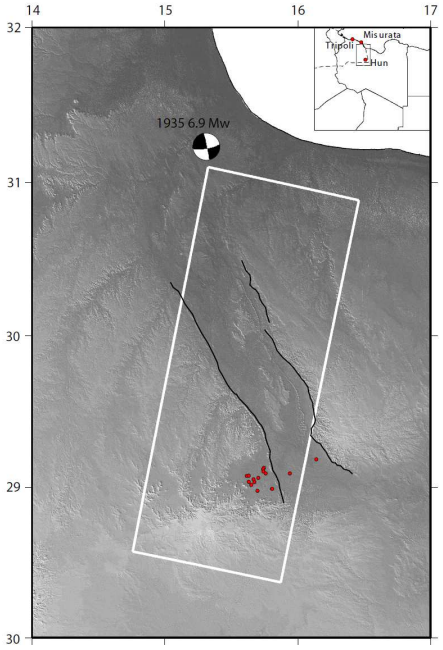


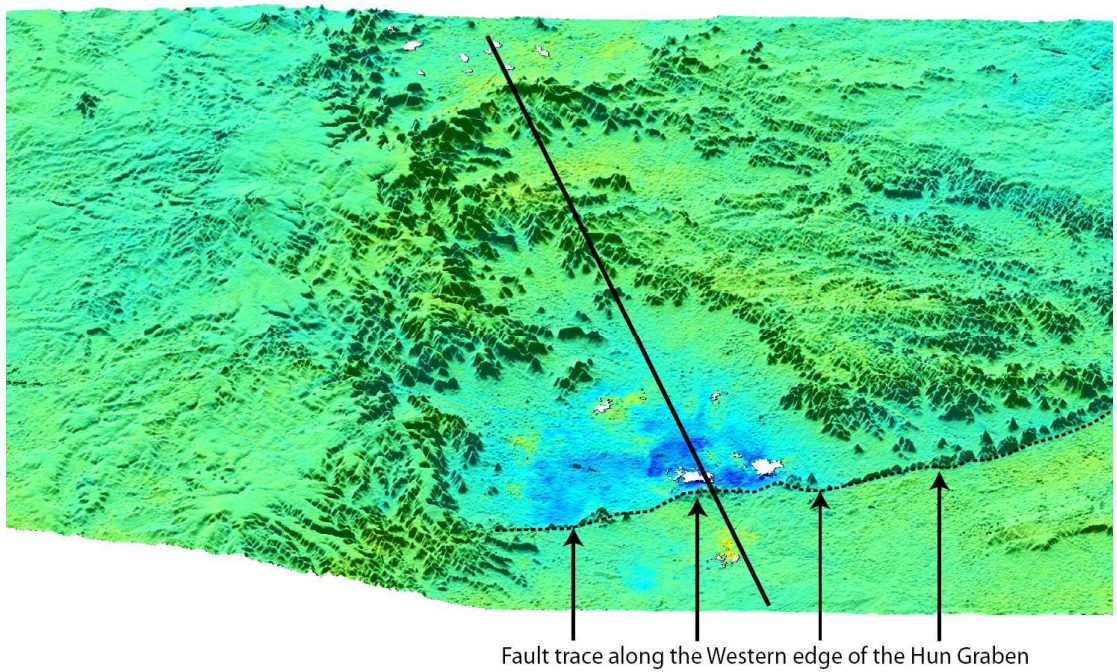


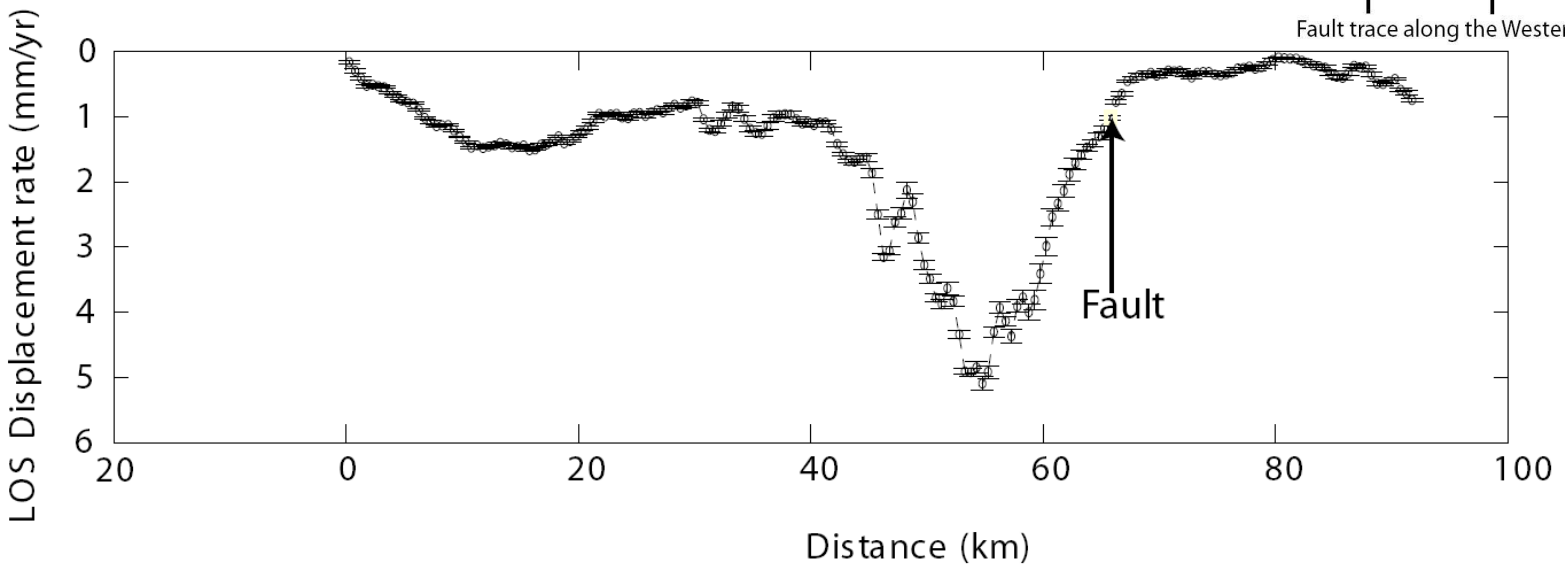
Transients induced by shallow water circulation



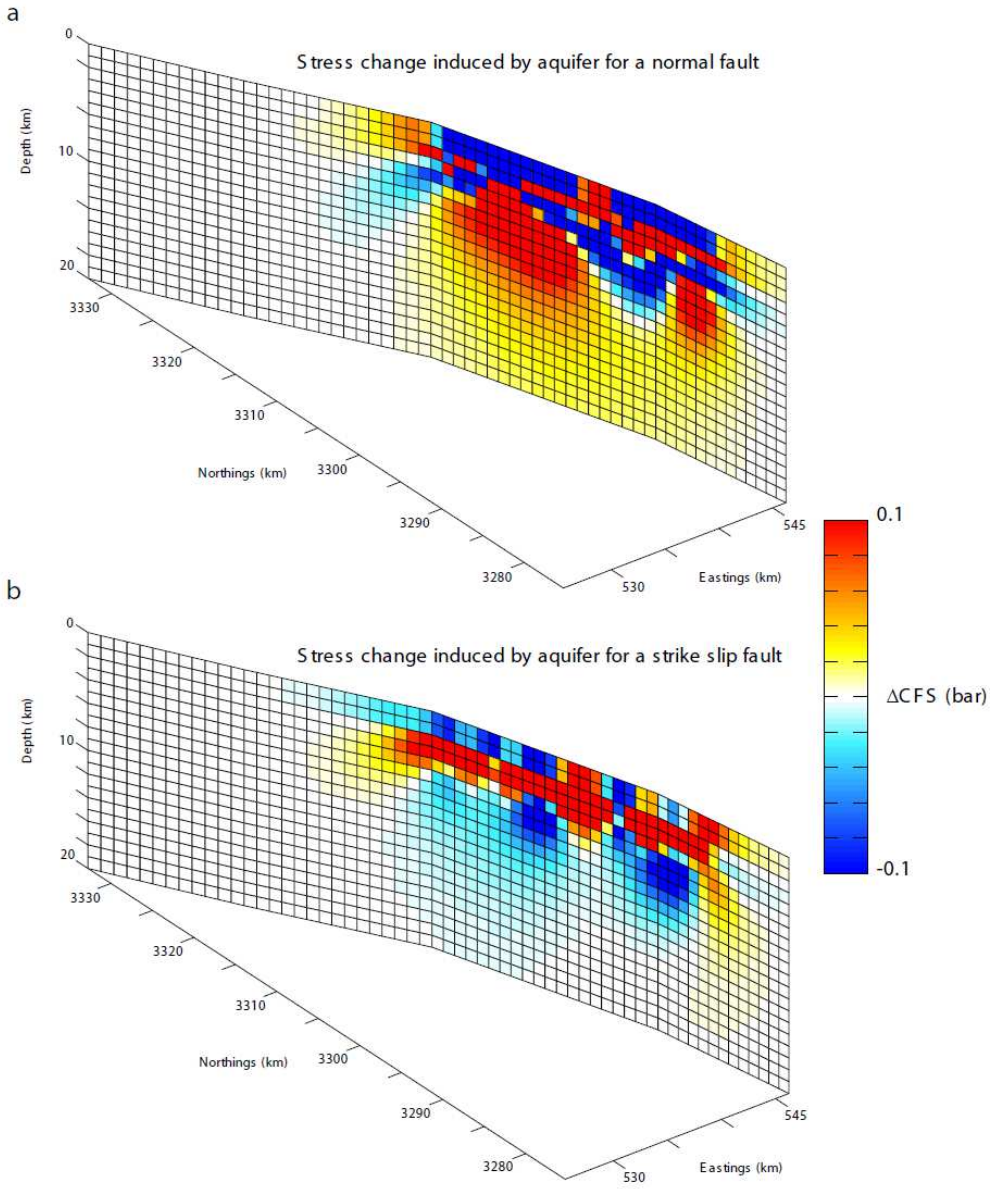
Deformation along the Hun Graben- Libya







Effect of pumping on bounding fault



Coulomb failure stress along the western border fault of the Hun Graben assuming a normal (a) and strike-slip (b) mechanism after 12 years of pumping.

Maximum stress change for a normal fault is ~0.2 bar/yr

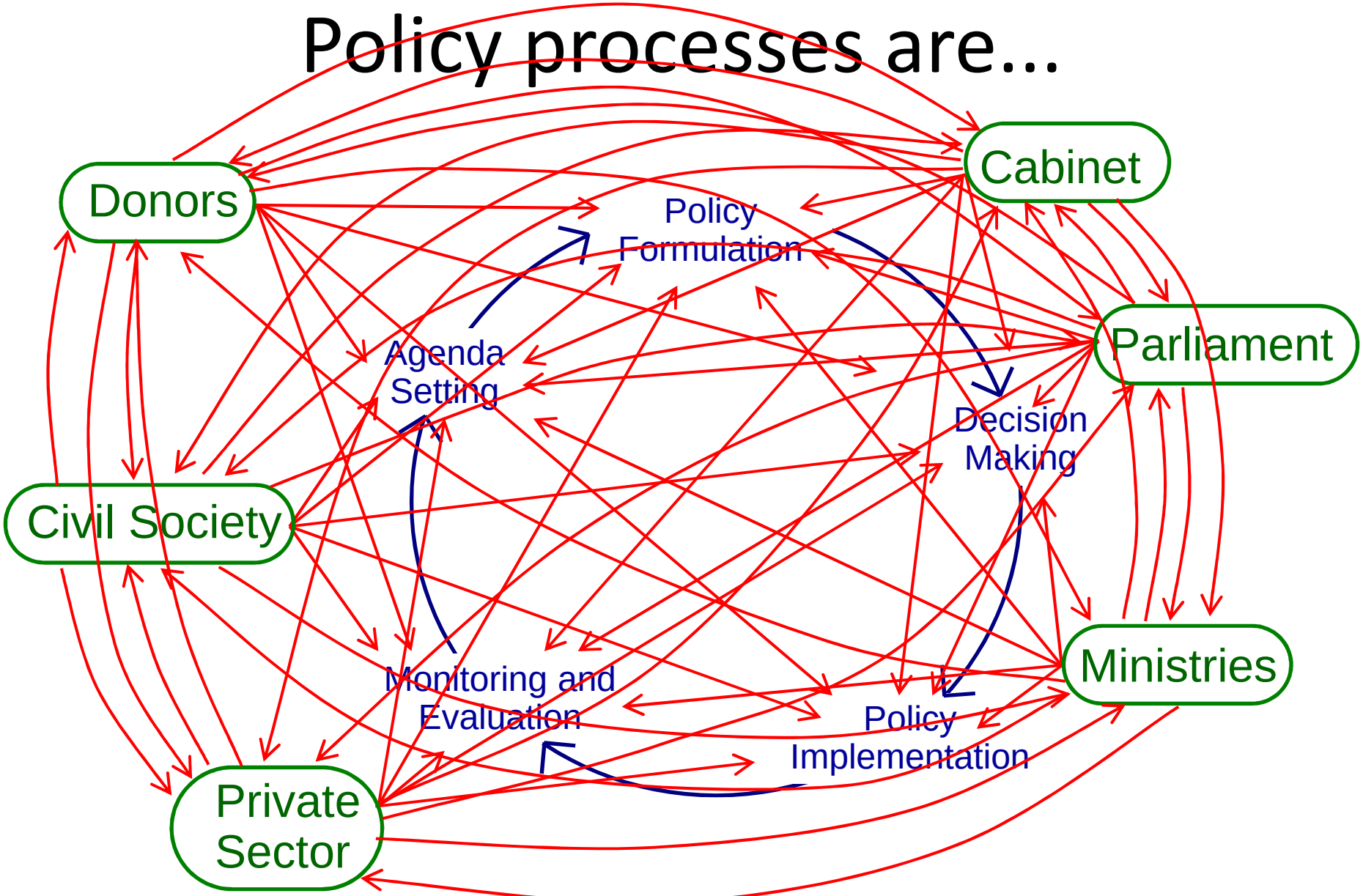
What NEXT?:

Maximising the impact of research

Pancaked appartment

Presidential Palace destroyed

Policy processes are...



Source: Phil Davies Impact to Insight Meeting, ODI, 2005

Policy makers are…

…practically incapable of using research-based evidence

Vincent Cable – Lib. Democrat MP & Shadow Minister of Finance

More at: www.odi.org.uk/RAPID/Meetings/Evidence

Different notions of evidence

Researchers' Evidence	Policy Makers' Evidence
• 'Scientific' (Context free) • Proven empirically • Theoretically driven • As long as it takes	• Colloquial (Contextual) • Anything that seems reasonable • Policy relevant • Timely

Source: Phil Davies Impact to Insight Meeting, ODI, 2005