



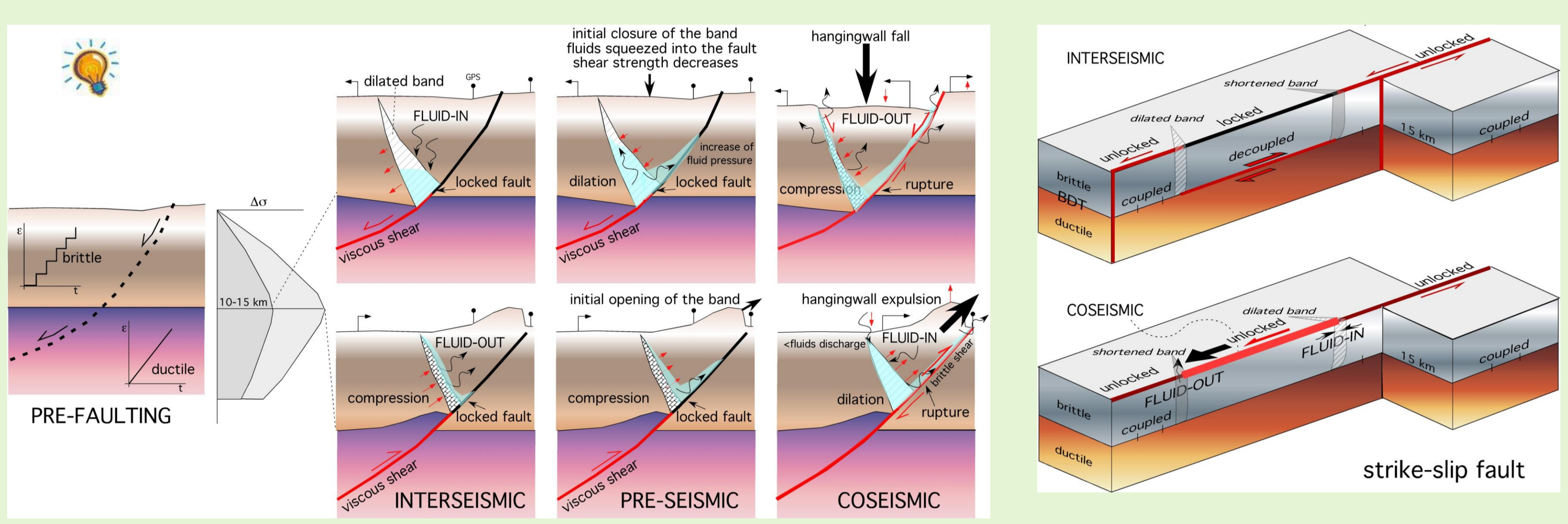
The brittle-ductile transition as the switch of earthquakes: applications for seismic prediction



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FAULT ON - OFF

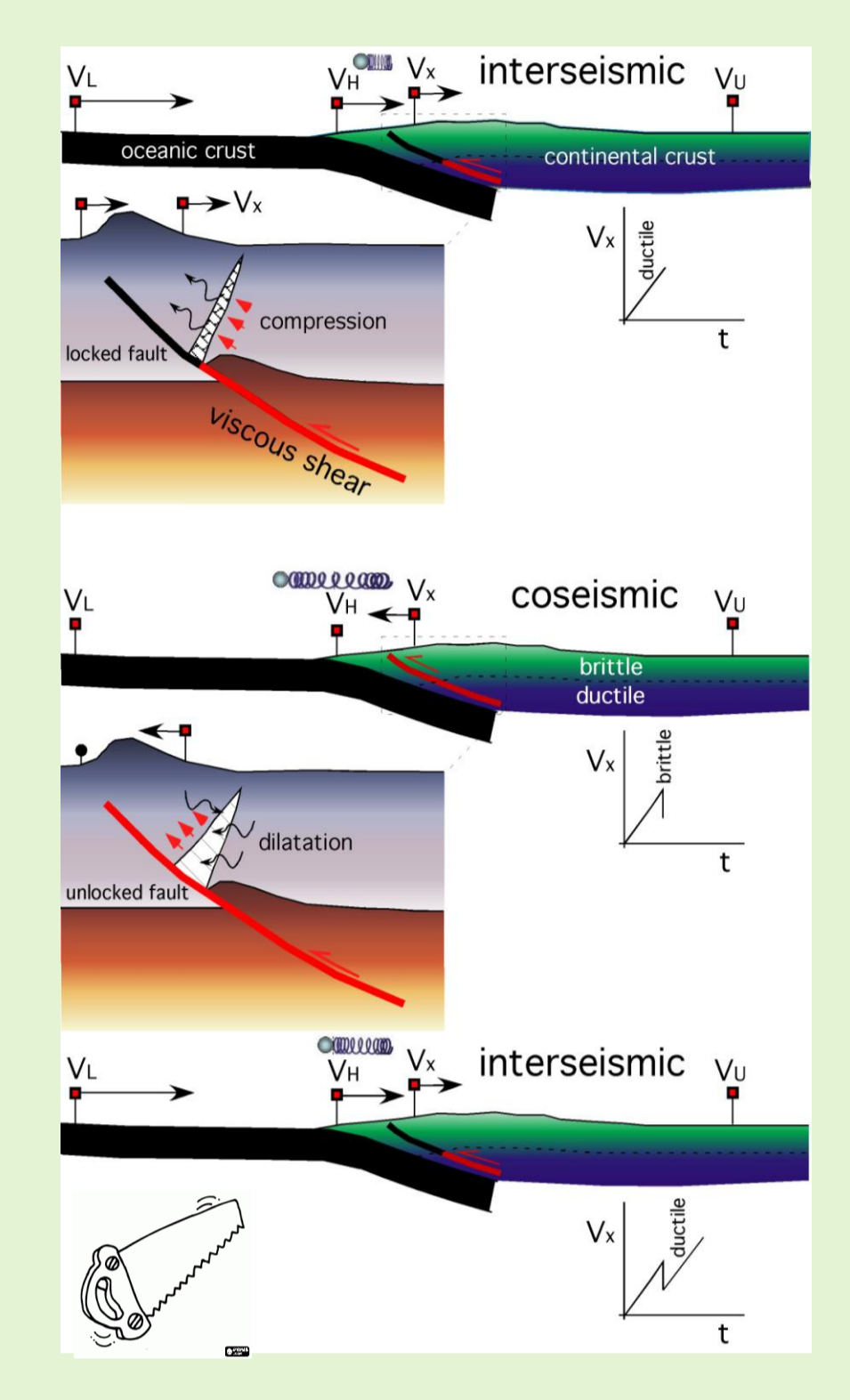
The brittle-ductile transition (BDT) separates the lower crust where deformation occurs in steady-state regime, from the upper crust where it is rather dominated by stick-slip. The fault hangingwall above BDT accumulates elastic energy during the interseismic period, without significant evidence of surface strain rate. Faults activate in areas of high strain rate gradients along the segments with lower strain rates. Fluid discharge varies as a function of the tectonic setting. The phenomenology gives insights for the parameters to be monitored in earthquake forecasting.



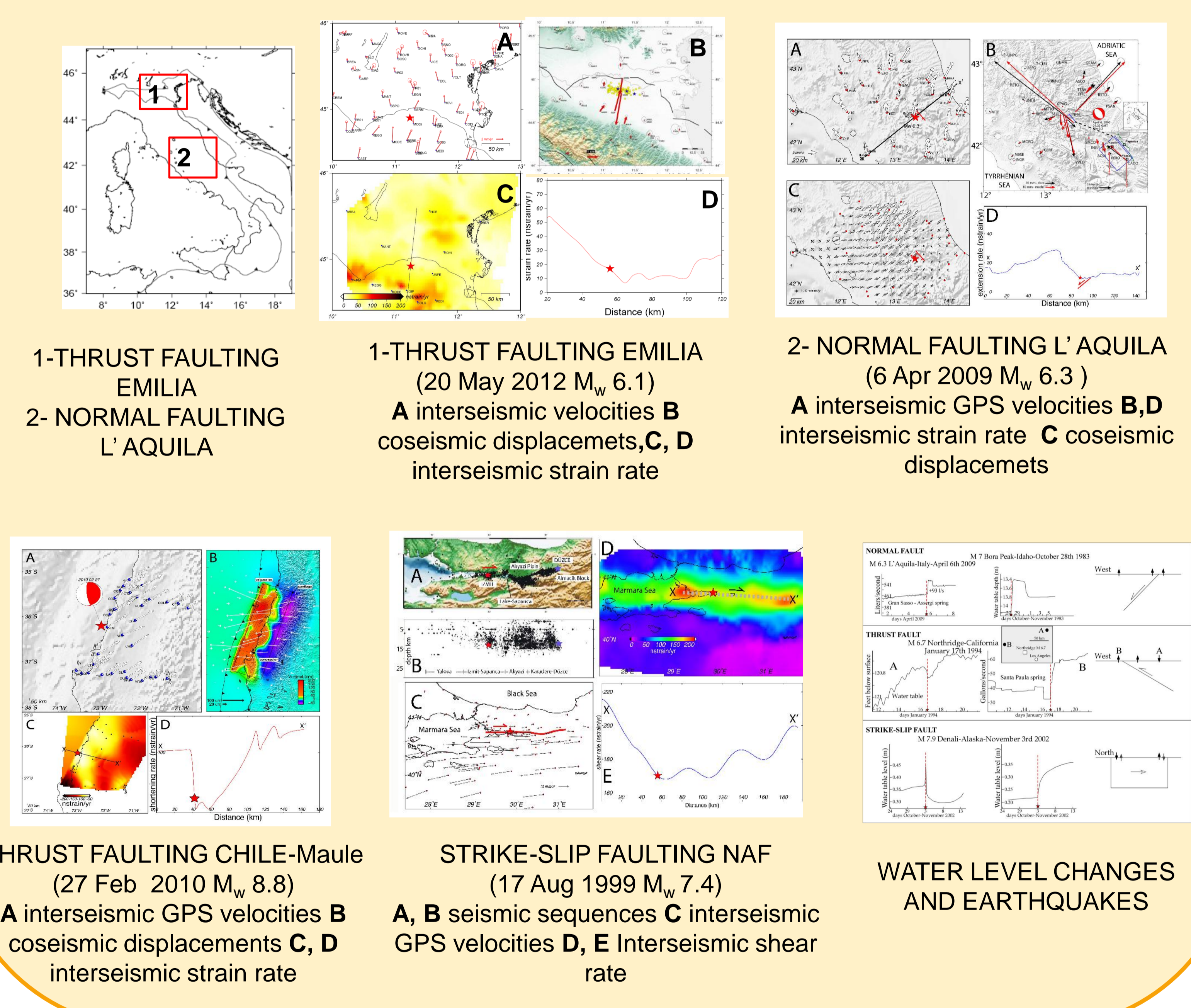
The BDT acts differently in different tectonic settings as the switch of earthquakes

SAWTOOTH PROFILE

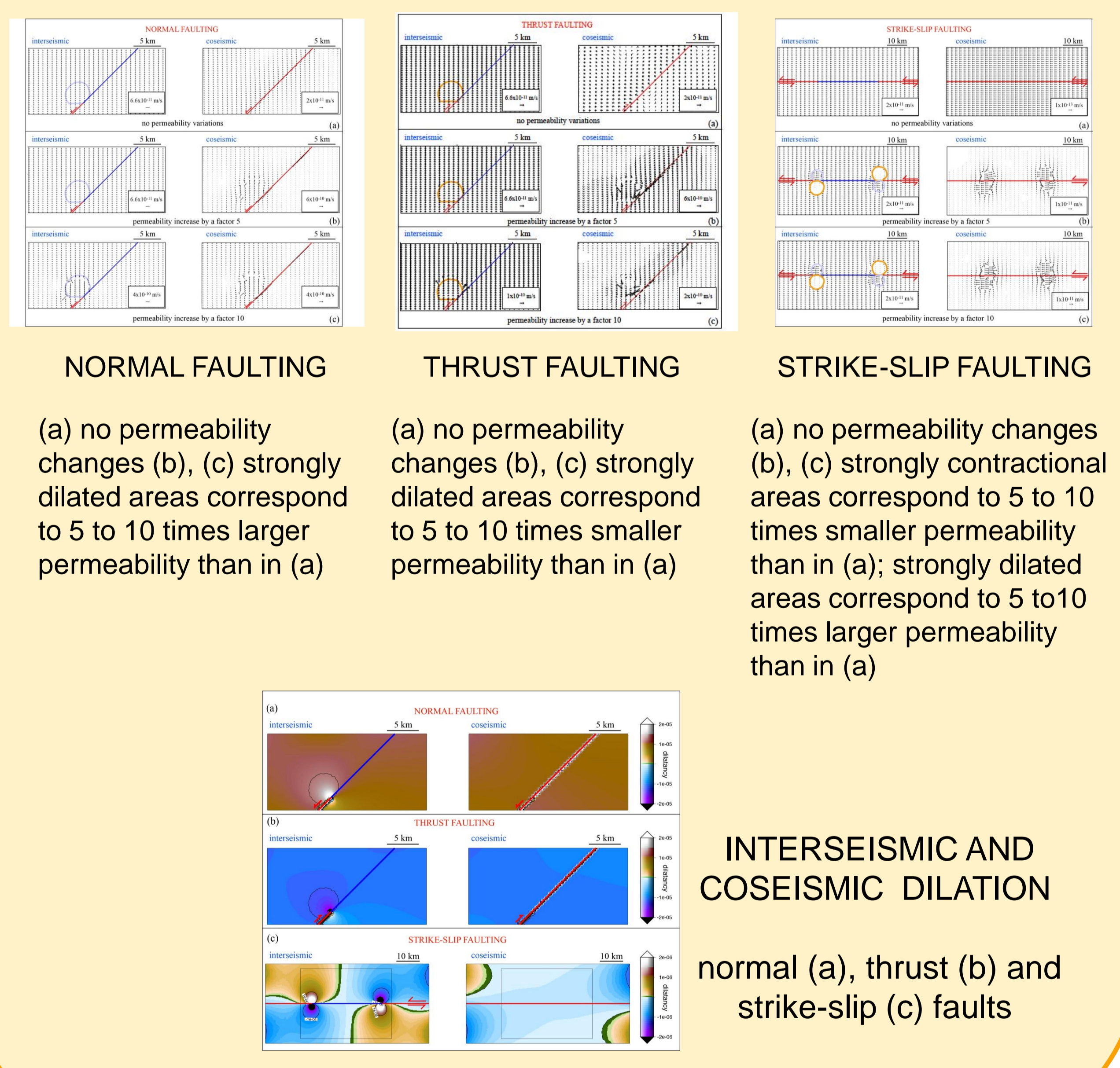
The cumulative upper plate-directed shift of the reference (x) has interseismic periods of convergence and shortening toward the upper plate, coseismic stages have opposed rebounds toward the lower plate.



DATA

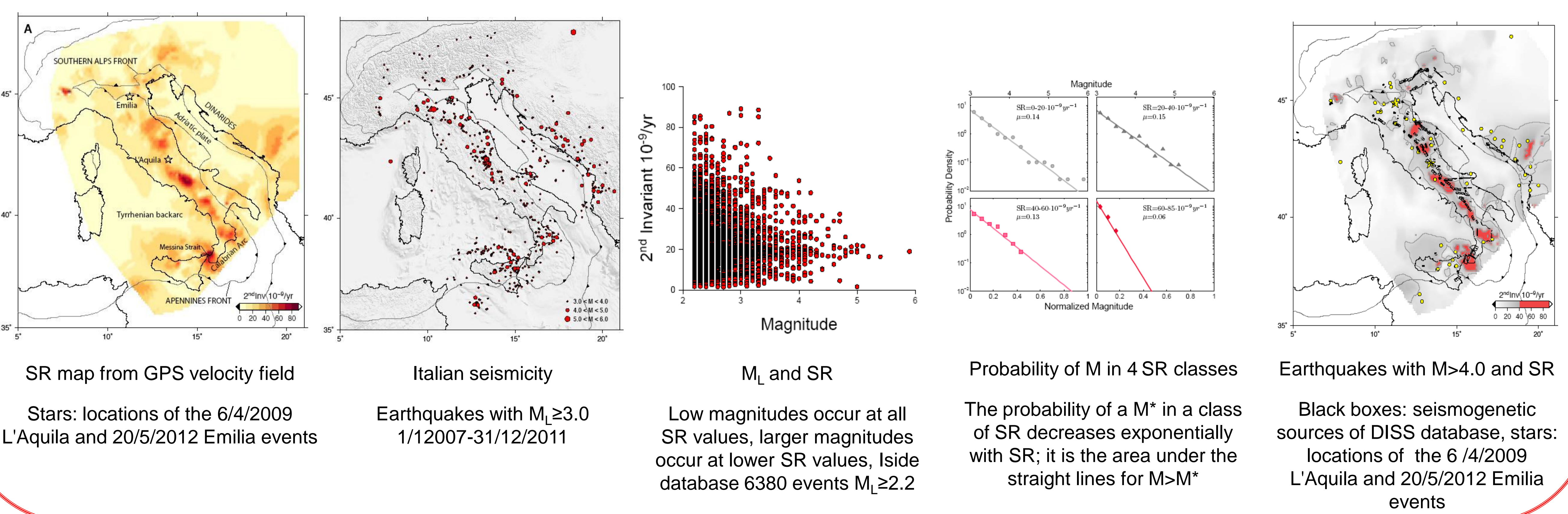


FLUIDS/ROCKS INTERACTION MODELING (COMSOL package)



WHERE THE NEXT EARTHQUAKE ?

Elastic energy accumulates in areas where faults are locked and then strain rate (SR) is lower. SR lows are more prone to release larger amount of energy with respect to adjacent higher SR zones.



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