Hydrologic induced deformation: Distinguish surface loading from pressure induced uplift.


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The observation of crustal deformation is a means to calculate the strain rates and the stress loading at faults. The strain rate is expected to vary in time during the earthquake cycle, but also due to hydrologic masses and fluxes. Hydrologic mass is an elastic loading of the crust, with a consequent lowering and return to the starting position. The opposite effect occurs in places in which the subsurface waters are constrained to flow in channels with consequent buildup of pressure of the water, which determines a surface uplift and deformation. This latter effect is present in karst areas, and in particular in the classical karst shared between Italy and Slovenia, where crustal deformation is measured with tiltmeters in caves and GPS at the surface.