: 16:30h
AN: H14C-03 [Abstracts]
TI: Leaking And Non-leaking Systems: Study Of Natural CO2 Accumulations For Geological Sequestration
AU: * Voltattorni, N
EM: nunzia.voltattorni@ingv.it
AF: Istituto Nazionale di Geofisica e Vulcanologia, Via di Vigna Murata 605, rome, 00143, Italy
AU: Cantucci, B
EM: barbara.cantucci@ingv.it
AF: Istituto Nazionale di Geofisica e Vulcanologia, Via di Vigna Murata 605, rome, 00143, Italy
AU: Cinti, D
EM: daniele.cinti@ingv.it
AF: Istituto Nazionale di Geofisica e Vulcanologia, Via di Vigna Murata 605, rome, 00143, Italy
AB: The potential risks of geological CO_2 storage must be understood and geologists are required to predict how CO_2 may behave once stored underground. As natural geological accumulations of carbon dioxide occur in many basins in Italy and volcanic and seismically active areas allow CO_2 rich fluids to migrate to the near surface, many of these areas have been investigated in order to study long-term geochemical processes that may occur following geological storage of anthropogenic CO_2. A study representing an example of "leaking" system is the Solfatara crater (Campi Flegrei, Southern Italy) characterised by the presence of both CO_2 rich-waters and fumarole. Soil gas flux measurements show that the entire area discharges between 1200 and 1500 tons of CO_2 a day. Most part of analysed waters is the effect of a mixing between a shallow meteoric water and a deep thermal Na-Cl end-member and/or seawater, resulting in sodium-chloride waters. A high dissolved CO_2 content (max value 566.28 cc/l) is also present. Furthermore, the Campi Flegrei frequently undergo bradyseism related to the elastic response of the shallow crust to increasing pressure within a shallow magma chamber. The study of this phenomenon could be useful to detect ground deformation linked to geomechanical changes in a geological CO_2 reservoir. In contrast, an example of "non-leaking" system is the Pisticci oil and gas Field (Southern Italy) where a great variety of hydrocarbons traps are formed by horst and tilted blocks in the Mesozoic carbonate substratum covered by an almost continuous sequence of Lower Pliocene marls and Middle Pliocene-Pleistocene marly blue clays. Soil gas surveys were performed after a MD 4.5 earthquake and two years later to test the permanence of the gas distribution pattern. CO_2 distribution in soil gas seems not to be affected by changes in stress, as suggested by the average values of both surveys. The principal aim of our research has been to evaluate and mitigate risks for local populations as the studied areas are densely populated. To date, the obtained results suggest that gas uprising is generally well localised around restricted areas, often controlled by local tectonics (faults and/or fractures). This implies that, in the frame of geological CO_2 sequestration, it is necessary to carefully assess the presence of pathways (fault and/or fractures) that might allow the migration of CO_2 out of the reservoir.
DE: 1065 Major and trace element geochemistry
DE: 1099 General or miscellaneous
DE: 1830 Groundwater/surface water interaction
SC: Hydrology [H]
MN: 2008 Fall Meeting