

CO2 emissions from soils as indicators of tectonic-volcanic activity at Monogenetic Volcanic Fields

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Gas emission at volcanoes is a routine technique for understanding the behavior of their internal systems and magmatic evolution. Gas emission measurements can be made at central volcanoes during eruptive and repose stages. At monogenetic volcanic fields however, there are no particular vents where volcanic gases can be conducted. Moreover, there are no volcanic gases present until a magmatic event starts but the time between the generation and startup of an eruption could be so fast until a new volcano is born that no monitoring is possible so far, in order to anticipate a volcano birth event. This is why Delgado Granados and Villalpando Cortes (2008) proposed a new method carrying out studies of CO₂ emissions from soil in order to identify areas of structural weakness that may serve as conduits for future eruptions. The CO₂ measured at volcanic fields is not magmatic but indicative of the tectonic activity in the field. So, these studies reflect the state of stresses in the field and the presumption is that the most tectonically active zones are prone to conduct magmas in case of the generation of melt that may ascend from depth to the surface. The areas with higher CO₂ emissions are then, related to the areas with larger possibility to host a new volcano. The results are thought to be useful for hazards assessment. Here, results of measurements made at several Mexican and New Zealand monogenetic fields (at Chichinautzin, Xalapa, Michoacan-Guanajuato, and Auckland) are presented. Also, a comparison with measurements made at the San Andreas Fault system is shown in order to compare the emissions in tectonic and volcanic regions.