

### **Spatial Distributions of Extrusive Vents Within Mud Volcano Systems from Azerbaijan**

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Mud volcanoes are a widespread type of piercement structure that allow for focussed fluid escape from sedimentary basins. Little is known, however, about the small scale structure of these feeder systems and how they take advantage of natural weaknesses and pathways that are already present in the country rock that they intrude (Davies & Stewart, 2005). The distributions of extrusive vent features on mud volcano summits has been the subject of much debate but as of yet has not been quantitatively analysed. To date only the trend of large mud volcano systems has been identified (Kopf, 2002). Here mapping and statistical analysis of vent type (gryphon, salse and cinder mound) distributions is described from several mud volcanoes in Azerbaijan. The distribution of the extrusive features reveals that the vents are found to: 1) lie along conjugate fractures, 2) ring faults (caldera collapse), and 3) detachment faults found in the country rock. Clustering of different eruptive phases also suggests possible phase separation is occurring at depth. Using ratios of the vent phases we develop a new method for categorising mud volcanoes on their dominant vent type. The goal of these spatial studies is to provide insight into the link between the distribution of vents and causal processes. Ideally the combination of spatial and alignment statistics and mapping of mud volcano vents provides a thorough basis from which the development and nature of intrusion of country rock is interpreted.