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The Auckland Volcanic Field - a basaltic field showing random behavior?

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Basaltic monogenetic volcanism is a worldwide phenomenon typically producing fields of volcanic centers that increase in number with time. The process of field growth is not constant but punctuated by single eruptions, flare-ups and hiatuses. The development of a volcanic field involves physical processes that occur in the mantle, where batches of basaltic magma originate, and within the intervening lithosphere through which magma is transferred to the surface. The spatial and temporal distribution of volcanic centers within such volcanic fields results from, and thus may provide insights to, these physical processes (e.g., magma production, tectonic controls), thereby aiding in our understanding of a volcanic field's future development.
The Auckland Volcanic Field (AVF), which lies in the most populated area of New Zealand, comprises 50 volcanic centers and produced its last eruption $\sim$600 years ago. A recent study has provided a relative chronology of the entire sequence of eruptions, which is here used together with the spatial distribution of volcanic centers to investigate the evolution of the field in time and space. Two methods were used: 1) the Poisson Nearest Neighbor (PNN) analysis which evaluates the spatial distribution of a natural population over the spatial distribution of a statistical random model, the Poisson model; and 2) the Voronoi analysis which evaluates the spatial characteristics of each volcanic center by dividing a region (i.e. the volcanic field) into a set of polygons.
The results of the PNN analysis show that the temporal evolution of the spatial distribution of the volcanic centers within the AVF follows the Poisson model, therefore they cannot be used to extrapolate the future evolution of the volcanic field. The preliminary results of the Voronoi analysis show in combination with the geochemical signatures from some volcanic centers a possible zonation within the source region, and/or the magmas may be variably affected on their way to the surface, the chemistry of the erupted lavas is showing a higher SiO_2 content inside the field rather than on its edges.