



Volcanism in the Eifel

Volcanic phenomena (volcanoes, maars and calderas) occur where magma reaches the surface or undep subsurface, most commonly in an extensional tectonic setting. Their location typically indicates existing fault traces or locations of hydraulic fracturing along which the magma intruded the brittle crust (Galland et al., 2007).

See also

[Dreisborn CO₂ springs](#), [CO₂-rich water in Gerolstein](#), [CO₂-seeps around Duppach](#), [CO₂-rich water around Daun](#), [CO₂-rich springs in Dreis-Brück](#), [CO₂-seeps around the Laacher See](#)

Anomalies

In the Eifel, distinct magmatic activity took place during the Tertiary and Quaternary. Volcanoes and associated maars formed in the Eifel during two periods in the Tertiary: at ~42 – 34 Ma in the Hocheifel, and at 26 – 18 Ma more eastwards, in the Siebengebirge. The magmatic rock composition varies from basalt to trachyte. In contrast to the Quaternary volcanism, lava flows are rare. Volcanoes of Quaternary age formed between ~700,000 and ~11,000 years ago. In the Westeifel, basaltic cinder cones with lavaflows and maar volcanoes dominate, while in the East Eifel, more viscous, silica- and alkali-rich magma erupted, giving rise to lava domes and calderas (van Overmeeren, 2014).

These volcanic phenomena relate to faults, initiated or reactivated during the uplift of the Rhenish Massif (side-effect of the Alpine Orogeny). Magma from decompression melting in the upper mantle rose along these fault planes to the Earth's surface and gave rise to multiple types of volcanic activity. Specifically, the Quaternary volcanoes in the Eifel are broadly oriented along two NW-SE trajectories, following fault systems that newly formed or were reactivated during crustal extension in view of uplift of the Rhenish Massif. Furthermore, maars are generated during explosive eruptions when rising magma (mostly along fault traces) encounters groundwater, while calderas result from the collapse of a large, undep magma chamber, after it erupted explosively and rapidly discharged its magma (van Overmeeren, 2014).

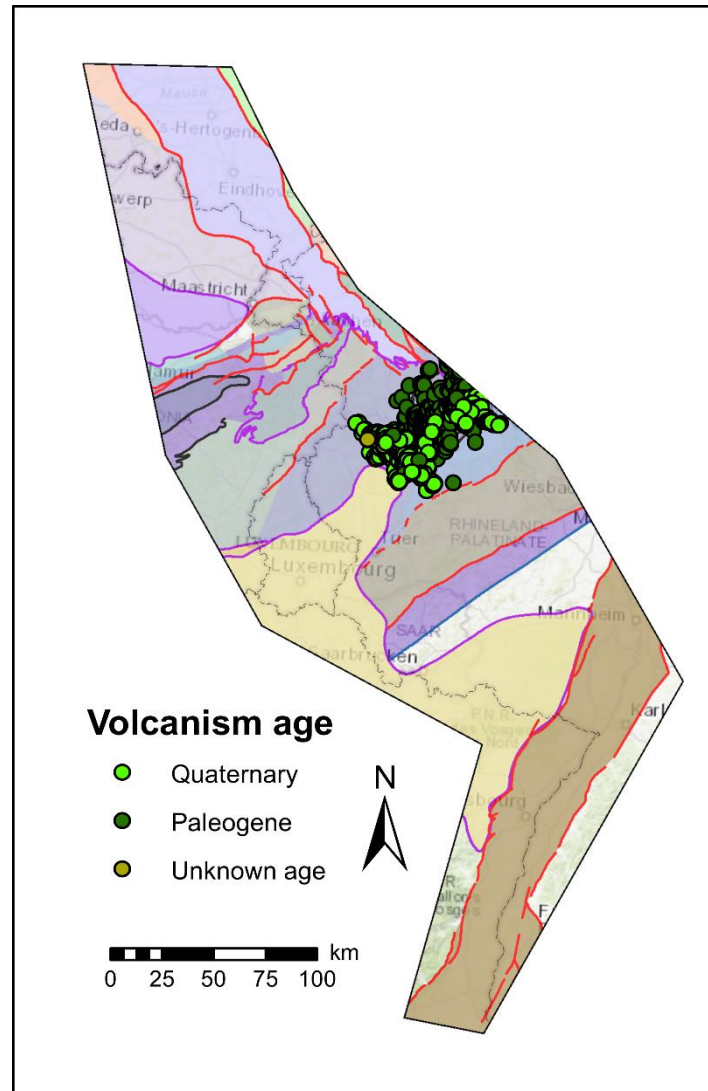


Figure 1: Volcanism in the Eifel



References

Galland, O., Cobbold, P.R., de Bremond d'Ars, J., Hallot, E., 2007. Rise and emplacement of magma during horizontal shortening of the brittle crust: Insights from experimental modeling. *Journal of Geophysical Research* 112.

van Overmeeren, R., 2014. Vulkanisme en CO₂ in de Eifel - Geologische (wandel)excursies. Universiteit Utrecht.

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