# Isotopic systematics of magma movement in the Krafla Central Volcano, North Iceland

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The Krafla Central Volcano and its associated fissure swarm experienced a rifting/magmatic episode 1975-1984. The episode had 16 rifting events - each with up to 2 meter horizontal rifting and 9 accompanied by basaltic fissure eruptions. During the episode a magma reservoir at 3 km depth below the central Krafla caldera was observed by crustal and seismic monitoring to deflate during rifting/eruptive events but inflate between. The southern end of the eruptive fissure extends from directly above the inflation center of the magma reservoir, across the caldera rim and 9 km to the north.

Of primary interest is a clear compositional difference between the lavas erupted within the caldera – over the observed magma reservoir – and the lavas erupted outside the caldera to the north – even on fissures that erupted simultaneously.

The difference extends to radiogenic isotopes (Pb, Nd, Sr, Hf) and incompatible trace elements, suggesting a first order mantle control rather than crustal differentiation, reflected in good correlation between most major and trace elements and the isotopic ratios.

There are 12 other Holocene intra-caldera lavas that show similar relationship. There is also a clear distinction between the lavas of the Krafla Volcanic System and the next system to the north the Theistareykir system.

# Changes in MOC revealed by chronostratigraphic correlation of ocean sediment cores via $^{14}$C plateau tuning

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Precise dating and correlation of climate records from deglacial ocean sediments is difficult due to unknown but highly variable reservoir ages. A plateau-tuning of high-resolution $^{14}$C data makes it possible to connect individual sediment records to a common master chronology, and reveals at the same time local reservoir ages, relative to this master chronology, through time. Changes in planktonic and benthic reservoir ages reflect changes in ocean Meridional Overturning Circulation (MOC) and (planktics) ocean-atmosphere exchange, that modulate oceanic heat transport and outgassing of oceanic $CO_2$, two important climate factors. Significant early deglacial changes in MOC and climate between 23 and 13 cal. ka, twice indicating opposite trends of change in deepwater formation over Heinrich 1 (H1) stadial, approx. 17 and 14.7 cal ka, are deduced from paleoreservoir age records from key sites for monitoring ocean circulation in the Icelandic Sea, northern Pacific, and eastern Indian Ocean, using a master chronology derived from three different published reference records with a suite of seven age-calibrated "$^{14}$C plateaus" [1].

[1]. Sarnthein *et al.* (2007) in Schmittner, A., J. Chiang, and S. Hemming (eds.) *AGU Geophys. Mon*. **173**, 175-196.