

# GRAVITY MODEL STUDIES OF THE VOLCANIC ISLAND SURTSEY, ICELAND

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## ABSTRACT

Gravity data collected by Cameron et al. (1992) have been used to model the internal structure of Surtsey, a volcanic island formed in an eruption off the south coast of Iceland 1963-1967. Several 2 1/2-dimensional forward gravity models were constructed, using existing data on the volcanic history and stratigraphy as constraints. The models show that the observed gravity anomalies can be explained by density variations within the volcanic edifice. The units of the best fitting models are: i) a core of hyaloclastite tuffs formed during the explosive phase of the eruption in 1963-1964; ii) a submarine delta of pillow lava breccias formed during the effusive eruptions after April 4, 1964; iii) subaerial lava; iv) subaerial tephra; and v) relatively dense sediments making up the northern peninsula. The volume of intrusions within the volcanic pile making up the island, is apparently too small to register in the gravity field. The models suggest that no appreciable volume of pillow lava exists under Surtsey.

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