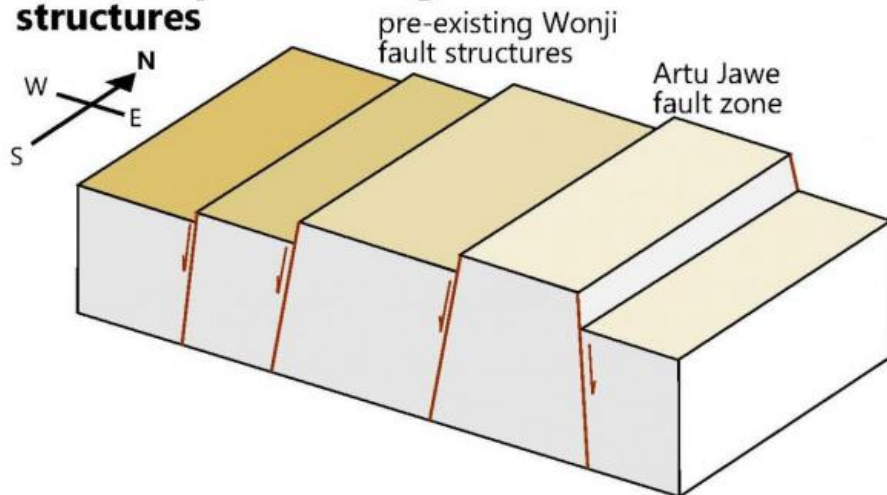


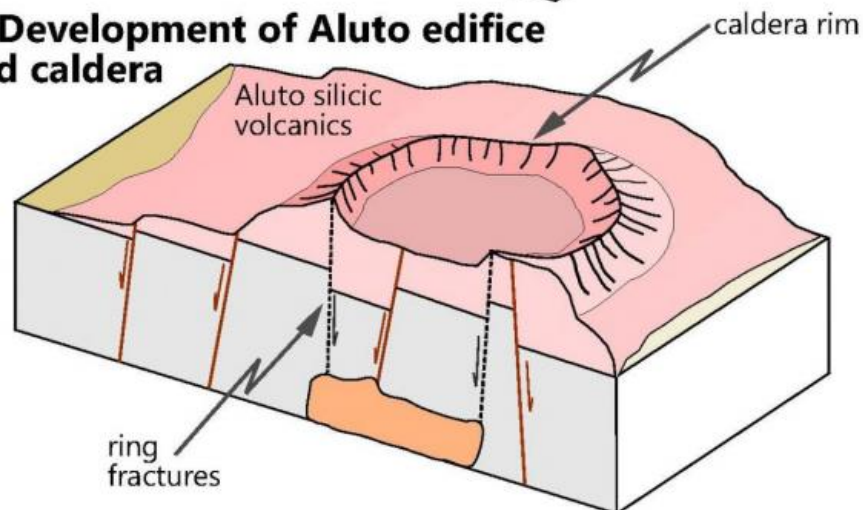
Geothermal energy, aluto volcano, and Ethiopia's rift valley

April 24 2015

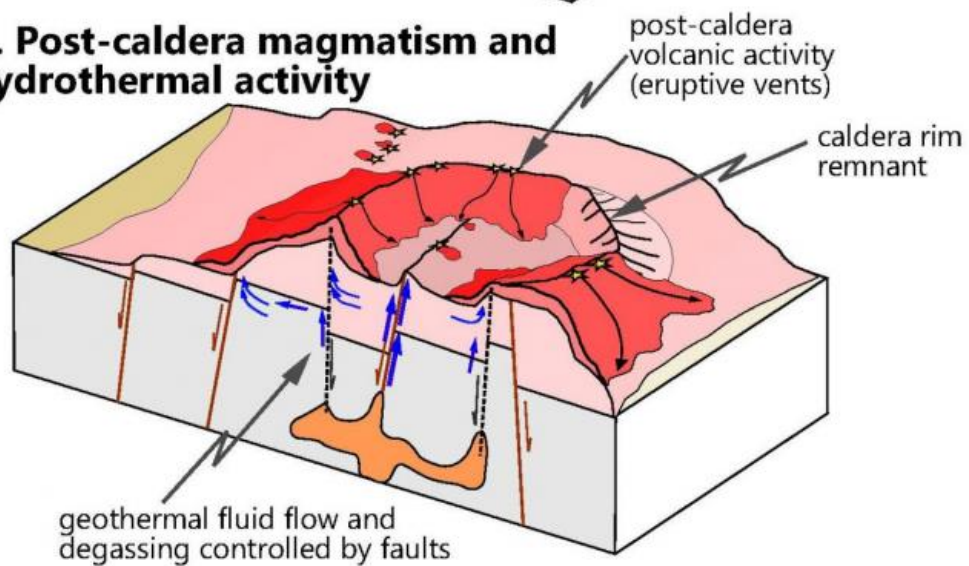
A. Development of regional tectonic structures



B. Development of Aluto edifice and caldera



C. Post-caldera magmatism and hydrothermal activity



Conceptual model summarizing the evolution of the major structures on Aluto volcano and their controls on surface volcanism, geothermal fluids, and degassing. Credit: Hutchison et al. and *Geosphere*

In their open access paper published in *Geosphere* this month, William Hutchison and colleagues present new data from Ethiopia's Rift Valley and Aluto volcano, a major volcano in the region. Aluto is Ethiopia's main source of geothermal energy, a low-carbon resource that is expected to grow considerably in the near future. Preexisting volcanic and tectonic structures have played a key role in the development of the Aluto volcanic complex and continue to facilitate the expulsion of gases and geothermal fluids.

Using high-resolution airborne imagery, field observations, and CO₂ degassing data, the authors explore in great detail how these preexisting structures control fluid pathways and spatial patterns of volcanism, hydrothermal alteration, and degassing. Understanding these preexisting structures, they write, "Is a major task toward defining the evolution of rift zones and also has important implications for geothermal exploration, mineralization, and the assessment of volcanic hazard."

In concluding their paper, Hutchison and colleagues write, "The new model for the structural development and volcanic edifice growth at Aluto opens up a number of avenues for future work. A major challenge is to determine how geothermal and magmatic fluids are distributed and stored in the subsurface of Aluto and how they ascend along the mapped fault zones." These future studies, they note, "should focus on generating high-spatial-resolution maps of off-rift [tectonic structures](#) and should be complemented by detailed field work to constrain the stress field

orientations during the development of the Aluto magma reservoir."

More information: Structural controls on fluid pathways in an active rift system: A case study of the Aluto volcanic complex, William Hutchison et al., COMET, University of Oxford, Oxford, UK. Published online on 2 Apr. 2015; <http://dx.doi.org/10.1130/GES01119.1>.

Provided by Geological Society of America

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