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Caldera structure, amount of collapse and erupted volumes:

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Calderas are common on volcanoes, but their structure is seldom visible. The ∼20 km wide Bolsena Caldera, Italy, formed between 0.6-0.2 Ma. The largely preserved structural rim and subsurface data make Bolsena the ideal case to investigate caldera structure in relation to the subsidence and erupted volumes; to this aim, we use original remote sensing and field analysis, and available subsurface data. At the surface, the caldera passes from a downsag (S rim) to a narrow and densely faulted area (N rim), with outer normal and inner reverse faults. The caldera structure on the widely faulted E rim appears scale-dependent, developing a staircase-like fault zone (larger scale), horst and graben-like structures (intermediate scale) and domino-like structures (smaller scale). Subsurface data highlight an asymmetric collapse, with a northward increase in the subsidence, passing from diffuse (to the S) to focused (to the N) deformation at the surface. The collapse rate, constant between ∼490-175 ka, was not paired by adequate magma output between ∼330-130 ka, highlighting significant (∼200 m) and prolonged (∼200 ka) post-eruptive subsidence. As the nearby Latera Caldera (W rim of Bolsena) was mostly active between ∼265-160 ka, the non-coeruptive collapse of Bolsena may be a far-field effect of the Latera eruptions, from a common magmatic reservoir. The subsidence-related structural variations along the caldera rim and the significant post-eruptive subsidence have not been previously found in any caldera and are the most remarkable features of Bolsena, to be considered for any general applicability to better understand calderas.