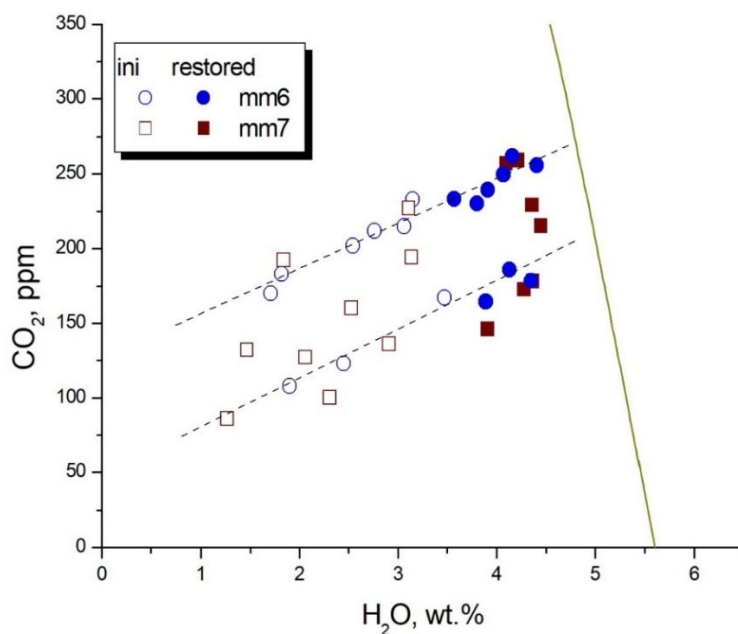
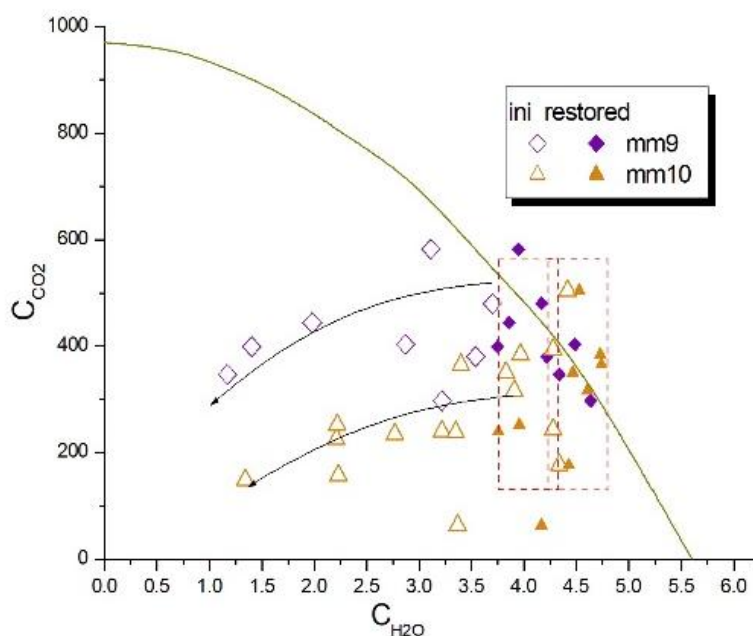


## Supplementary File S1

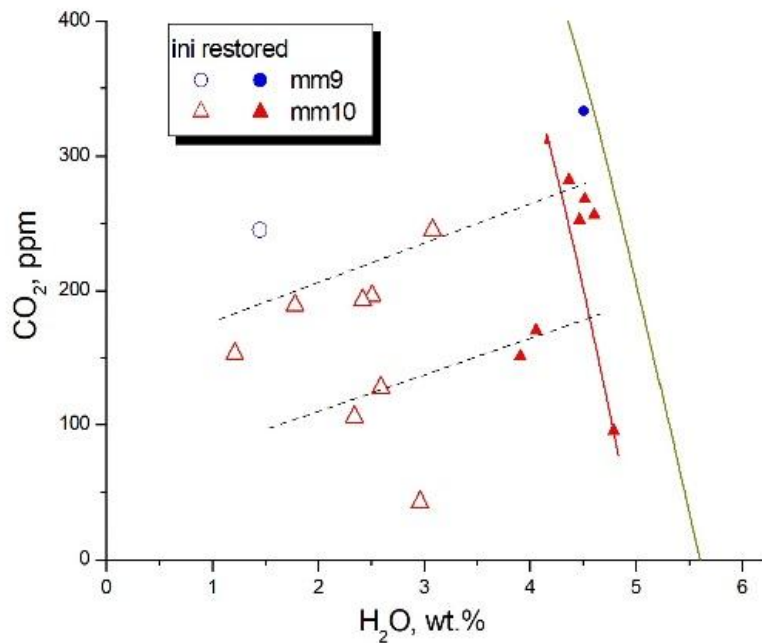
Compositions of MIs and reentrants in quartz from pre HRT-A Yellowstone eruption for individual horizons, data from [15].



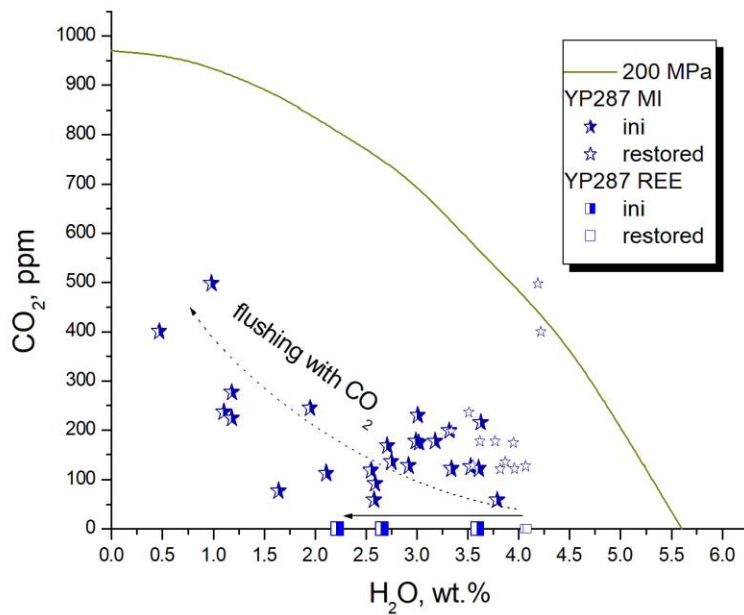
**Figure S1.1.** Reentrants data for the deepest sample MM7 and the sample located closer to it MM6: open symbols correspond to the original measurements, and filled symbols to the estimated initial composition. Dashed lines indicate trends of syneruptive degassing trends.



**Figure S1.2.** Melt inclusion data from samples MM9 and MM10 show that the  $\text{CO}_2$  content in these samples is several times higher than in samples MM6 and MM7. The slight offset of the initial and some measured melt inclusion compositions over the solubility curve at 200 MPa is observed.



**Figure S1.3.** Reentrants data for samples MM9 and MM10 from near roof magma: the initial CO<sub>2</sub> content in the reentrants melt is lower than in the corresponding MIs (Fig. S1.2).



**Figure S1.4.** Melt inclusion and reentrant data for sample YP287 from the upper part of the ash sequence. The reentrants exhibited CO<sub>2</sub>-free compositions subjected to syneruptive degassing. Sample presumably represents near bottom portion of magma that was subjected to the intense flushing with carbonaceous fluid and initiated the eruption of the basal HRT-A ignimbrites.