Two techniques exist for estimating terrestrial bolide flux rate. The astronomical method maps the number and brightness of NEOs, translates brightness into bolide diameter, then computes the fraction of these that might intersect the Earth’s orbit and position in a given period of time. The terrestrial method tabulates the number, size, and age of craters within a target area; then, together with a relation between crater size and bolide diameter, returns bolide flux. The great advantage of the terrestrial method is that it better represents ground truth -- it is hard to argue with the number and age of existing craters. Figure 1 plots the cumulative number versus age (0 to 500 Ma) and size (>0.5 km to >40 km diameter) for 166 known terrestrial craters listed in PASSC Earth Impact data set (University of New Brunswick, www.unb.ca/passc/ImpactDatabase/index.html). All craters within the stated size and age limits are included regardless of location and without any other selection criterion. In plots like Figure 1, straight lines represent a constant rate of crater production less crater destruction. You can see that 125 million years ago, terrestrial crater data suffered a striking increase in production less destruction. Using the same presentation but with smaller data set windowed to particular sub-areas, Hughes[1] too noted a tail off in cumulative crater counts older than 125 Ma. He however, associated the reduction in counts with an increased rate of crater destruction. I disagree. Rather, the transition at 125 Ma reflects a true change in crater production. My line of reasoning is three fold: (1) Cumulative cratering rates are remarkably linear over all crater diameters for 350 Ma prior to the transition and for 125 Ma after the transition. If crater loss due to erosion caused the tail off in slope backward in time that approach a saturation value where production equals destruction. They do not. (2) The transition happens almost instantly and nearly contemporaneously over the entire spectrum of crater diameters. If the transition related to crater weathering, it would be much broader in time and its position in time would be strongly size dependent. The fall off in small craters would show up much earlier than in larger craters because the former would be obliterated more quickly. (3) The ratio of slopes before 100 Ma and after 200 Ma computed by least squares fall almost exactly in the same ratio (1/4) for all crater sizes. Whatever changed the rate of production less destruction happened in the same proportion over all crater dimensions.

I see no explanation for these three features of Figure 1 other than a four-fold increase in crater production at 125 Ma induced by a four fold increase in impactor flux spanning all bolide sizes. Interestingly, Figure 1 hints that the smallest craters took the transition about 20 Ma later than the largest craters. This behavior might be consistent with collision and break up of two large bodies. Initially after the collision, bolide population would be over-weighted in larger fragments. It takes some period (20 Ma?) of follow-on collisions of these larger fragments to fully populate the small bolide ranks. If a factor of four change in the bolide flux occurred at 125 Ma, re-interpretations of crater count studies on the moon and elsewhere are in order for instances where crater populations spring from a mix of old and new bolide fluxes.

Reference: