

## **The CCD in the latest Maastrichtian: Implications for global carbon cycle resilience to the K/Pg impact and associated extinctions**

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Our best single source of information regarding the state of global (carbonate) carbon cycling at any point during the late Mesozoic and Cenozoic, comes from the distribution of CaCO<sub>3</sub> preserved in open ocean marine sediments and specifically, the depth of the carbonate compensation depth (CCD). Here, we present a reconstruction of the CCD during the latest Maastrichtian and use this to constrain the total global weathering flux and pelagic CaCO<sub>3</sub> export in an Earth system model ('cGENIE'). Although the CCD at this time is much shallower than modern, more, not less, cation throughput is required to reproduce the observations. All other things being equal this would equate to a better regulated system at the time of the end-K impact. However, the impact also drove widespread extinction amongst calcifying plankton that temporarily creates a large imbalance between input (weathering) and output (sedimentation). We use cGENIE to explore the consequences of both factors for post K-Pg changes in global carbon cycling.