What drives coccolithophore productivity changes and species turnovers? A Pliocene case-study from the NW Australian shelf

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The Late Miocene to Pliocene coccolithophore assemblages from two IODP drill sites (Expedition 356, Sites U1463 and U1464), located on the NW Australian shelf, were dominated by small-sized species of the Noelaerhabdaceae family. Despite their overall dominance, we observed a significant abundance crash and a major species turnover at around 4.6 Ma. This event marks a transition from assemblages dominated by small *Reticulofenestra* species to those dominated by small *Gephyrocapsa* species, but is not related to any extinctions. Although similar coccolithophore turnover events have been observed through time, it is still difficult to attribute them to specific global or regional driving mechanisms. Here, we tested how changes in the eccentricity of the Earth, and temperature and nutrient availability are related to this Pliocene coccolithophore turnover event. To achieve this, we used the record of absolute and relative coccolithophore abundances, Mg/Ca-based temperature estimates from nearby ODP Hole 763A, and a series of proxy elements (K, Ti, Fe) that are indicative of terrigenous input (and thus nutrient supply) in the area. An approach based on spectral analysis was used to attribute the observed evolutionary changes to specific Earth eccentricity cycles.