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Sedimentary evidence for increased phytoplankton calcification over the last two centuries

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Marine calcification governs the surface ocean's CO_2 storage capacity. Ocean acidification in response to rising atmospheric CO_2 concentrations is widely expected to reduce calcification by marine organisms. Such a decrease in calcification would increase surface ocean alkalinity, allowing increased drawdown of atmospheric CO_2. If linked to anthropogenic CO_2 production, this calcification response would act as a negative feedback on atmospheric CO_2. Planktonic organisms are thought to be the greatest calcium carbonate ($CaCO_3$) producers in the ocean, and of these, coccolithophores are considered the dominant group, with their external plates, coccoliths, constituting the largest single component of deep ocean carbonate sediment. Recent experiments challenge whether calcification by all coccolithophore species will decrease under rising pCO_2. Here we present the first field investigation of coccolith calcification over the past two centuries, demonstrating an unexpected increase in the mass of $CaCO_3$ per coccolith, coincident with increasing atmospheric pCO_2.