

## **Deciphering the $\delta^7\text{Li}$ record in carbonates**

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Lithium (Li) isotopes are an emerging geochemical proxy for tracking continental weathering processes through time. However, the factors that control the Li isotopic composition of seawater are still poorly constrained. The standard interpretation is that the seawater Li isotopic compositions track continental weathering processes and their input to the ocean. Less research has hitherto been devoted to the investigation of the effect of the seawater chemistry on Li removal.

In order to track global-scale changes in weathering processes and intensity through Earth's history, we have generated Li isotope data from marine carbonates from over 40 units, ranging in age from 3.0 Ga to modern. We combined this record with diagenetic modelling of the Li burial in marine sediments, aiming to identify the driving mechanisms behind this record. In particular, we aim to understand why the lithium isotope compositions were light in the deep past and what caused to their subsequent rise in the early Paleozoic. This shift may reflect the rise of land plants and an increase in terrestrial clay formation. However, we propose this shift also reflects the evolution of siliceous sponges and radiolaria, which would have decreased marine clay formation and thus Li burial within sediments.