

Figure 1: Example of um-scale skeletal features within a corallite. The gold-coated image (A) the trabeculae (T) and synapticulae (S) that form the larger mm-scale features of the corallite. In the transmitted light image (B), we see that the trabeculae, themselves are composed of micron-sized centers of calcification (COCs), from which tightly bundled aragonite fibers, the fasciculi (F) radiate outwards.

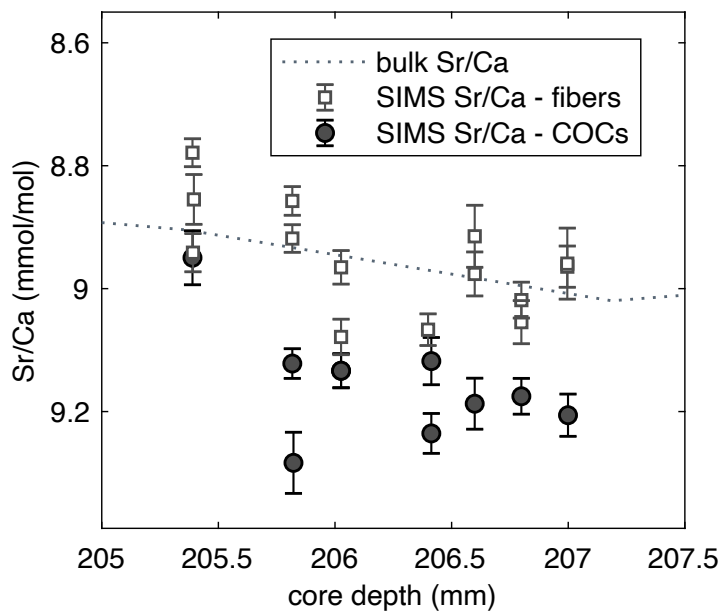
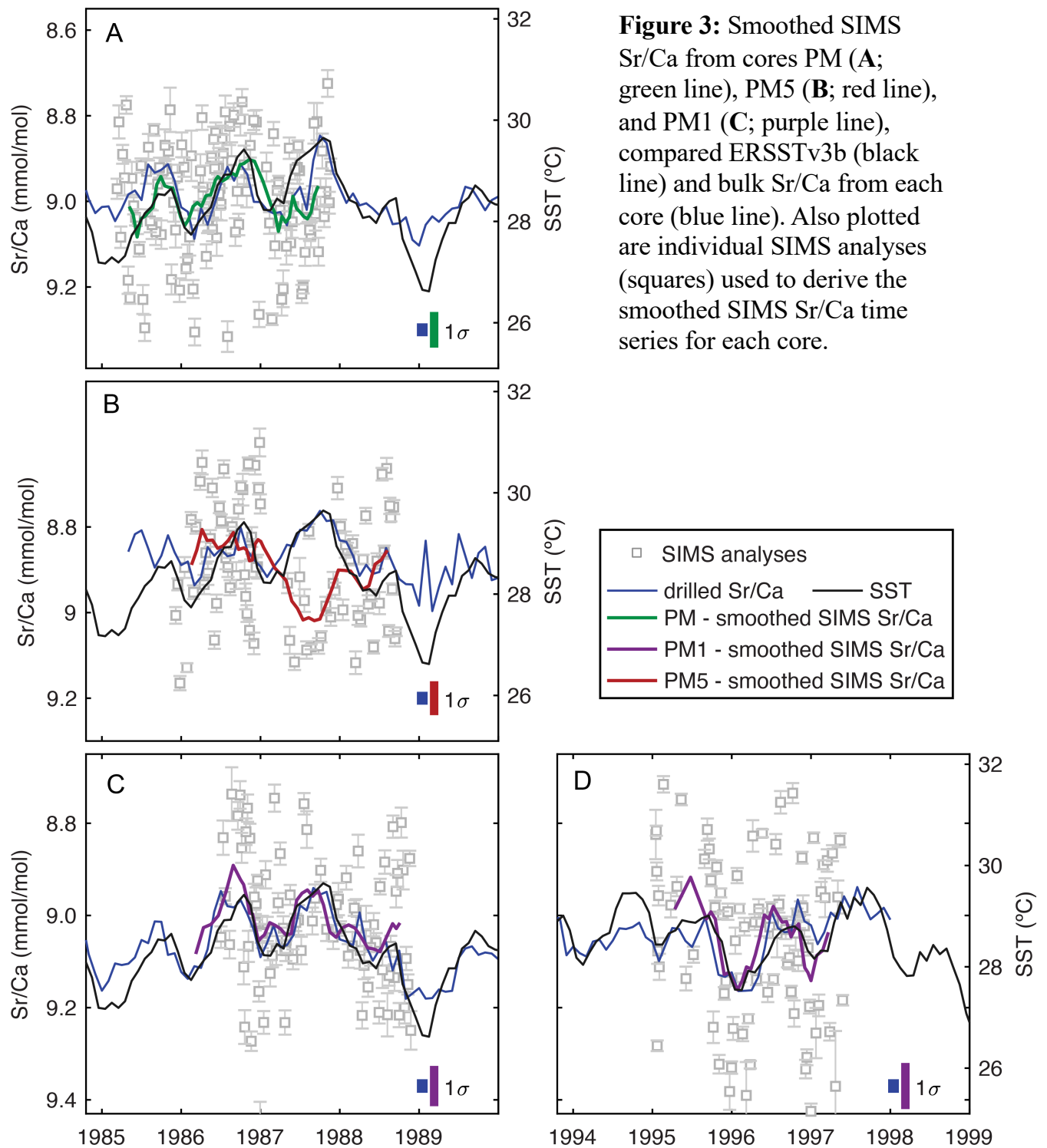


Figure 2: SIMS Sr/Ca analyses on COCs (filled circles) and adjacent fasciculi (open squares) compared to bulk Sr/Ca measurements across 3mm from core PM (dashed line). Error bars (1σ) represent analytical error for individual SIMS measurements.



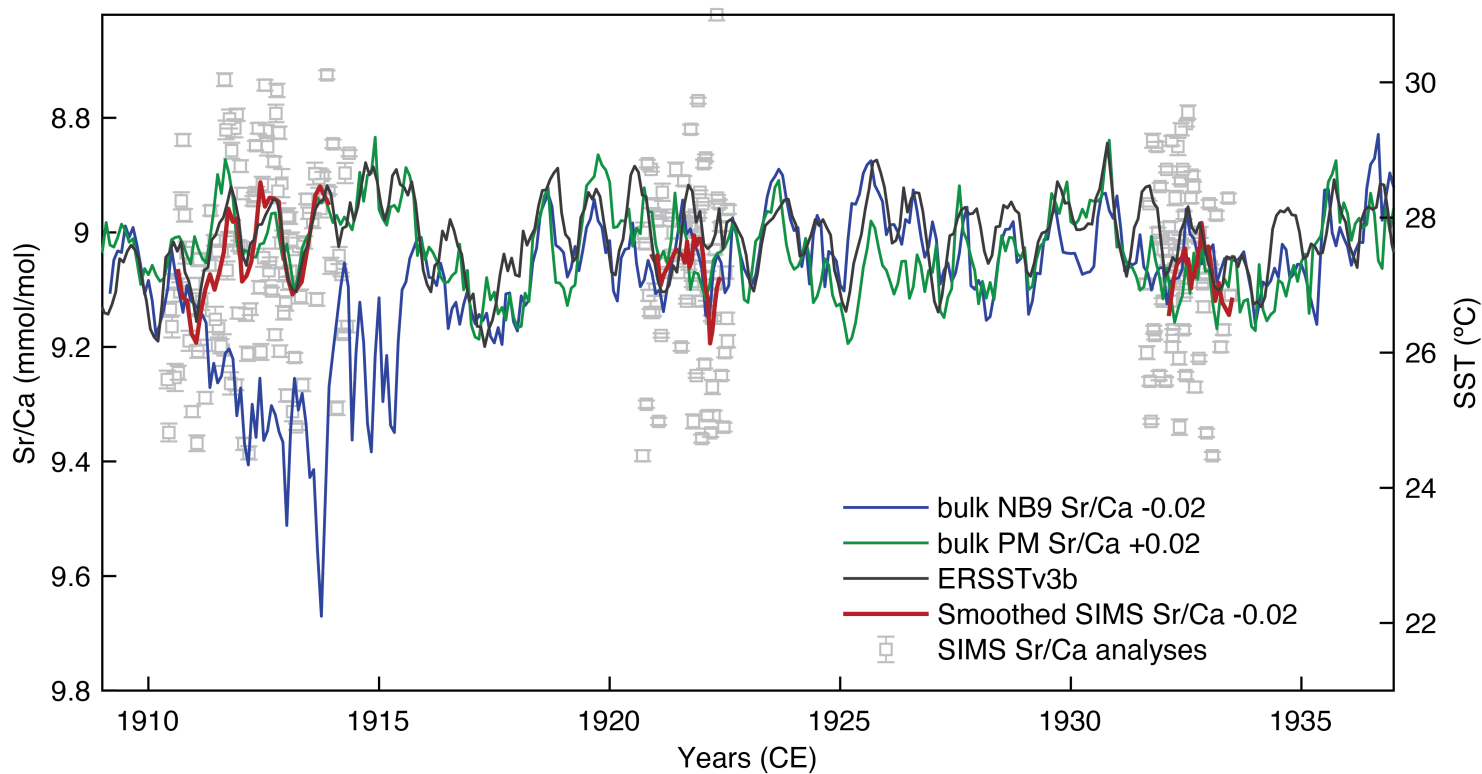


Figure 4: Bulk ICP-OES Sr/Ca from cores NB9 (blue line) and PM (green line) plotted against ERSSTv3b (black line) and smoothed SIMS Sr/Ca (red line). Squares represent individual SIMS analyses used to derive the smoothed SIMS Sr/Ca time series

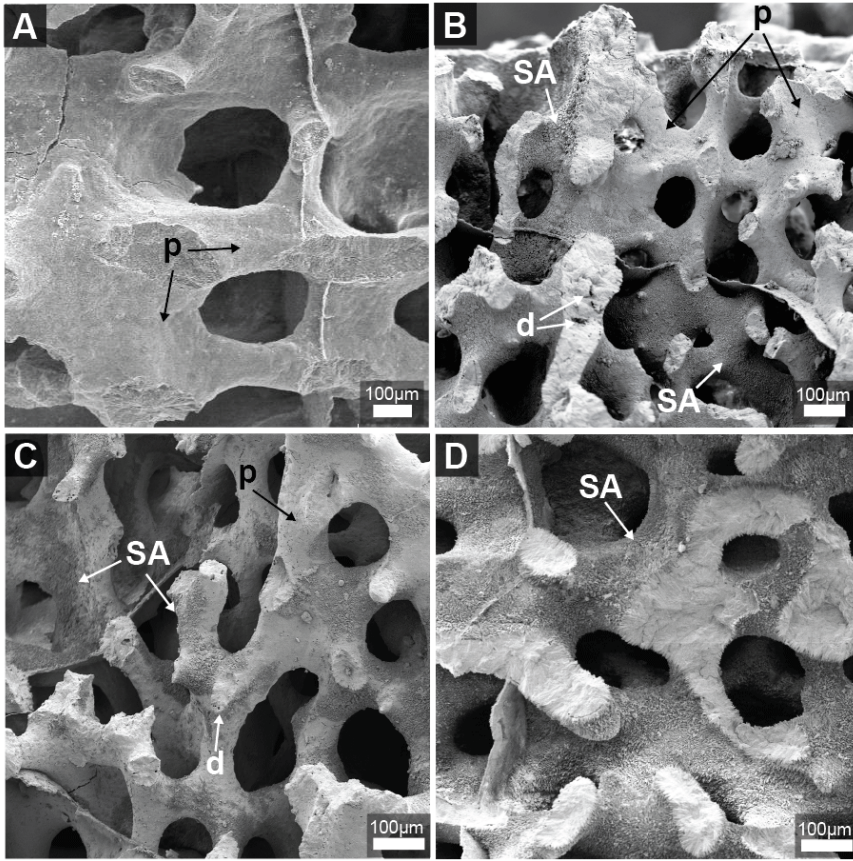


Figure 5: SEM images showing pristine skeletal structure in modern coral PM (A) and light to moderate diagenesis in fossil coral NB9 (B-C). Between 1931-1935 (B) and 1920-1922 (C), the coral skeleton in core NB9 is mostly well preserved (p), with a few patches of secondary aragonite (SA) and very minor dissolution (d). Between 1911-1914 (D), the coral skeleton is more consistently covered in secondary aragonite crystals.

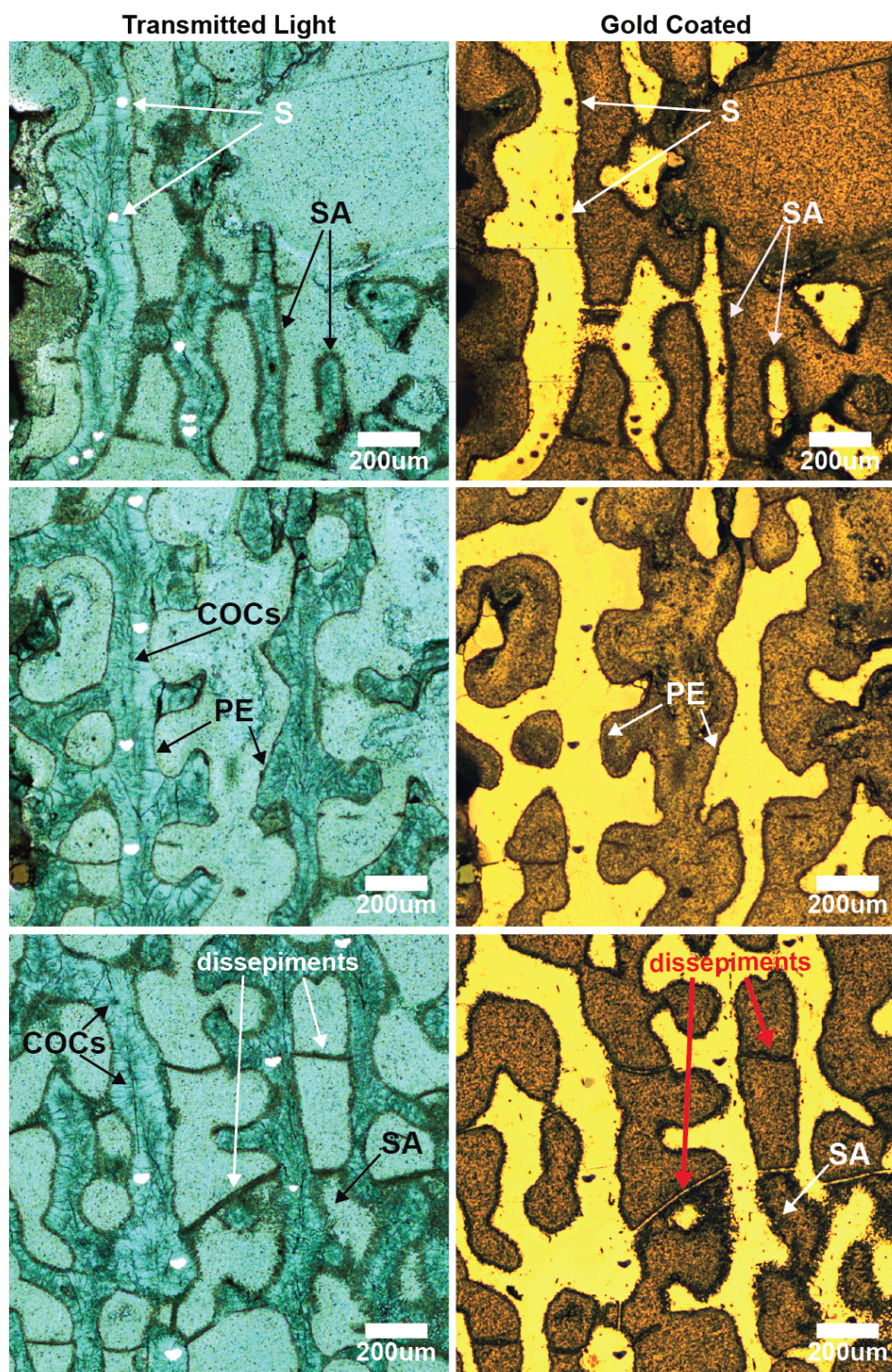


Figure 6: Transmitted (left) and reflected (right) images of thin sections from the 1911-1914 horizon of NB9. SIMS analyses (S) are shown as white spots in the transmitted light images and black spots in the reflected light images. Top and bottom panels show varying degrees of secondary aragonite infilling (SA), while panels in the middle show well preserved edges (PE).