



Aerobic microbial respiration in ancient oxic sediments below the Subtropical Gyres

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Microbial communities in marine sediments prevail without input of organic matter over millions of years. Their slow rate of metabolism and the slow sedimentation rate in the North Pacific Gyre allow oxygen to penetrate to at least 28 meters. Numerical modeling suggests that the penetration can potentially be much deeper. Since the entire sediment column is oxic there is no anaerobic respiration and all oxygen consumed can be ascribed to oxidation of organic matter in the dept where the oxygen disappears. This gives a unique opportunity to quantify the carbon mineralization rate as a function of sediment age across an immense time span. The oldest sediments we investigated are 70 million years old, and carbon is still being oxidized slowly at a quantifiable rate. The per cell oxygen consumption rates are the lowest ever measured.