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**Temporal and spatial variations of shallow-water benthic metabolism from an Aegean bay inhabited by *Callianassa tyrrhena***

The variations of sediment metabolism were followed in the shallow-water sediments of Vravrona Bay (Gulf of Petalioi, Aegean Sea, Greece) on a seasonal basis. Organic matter, in the form of dead leaves of the sea grass *Posidonia oceanica*, is imported in the bay from the meadows offshore. Three stations -with differences in sediment texture and densities of the burrowing shrimp *Callianassa tyrrhena* were selected along the longitudinal axis of the bay. In each station, sediment-water fluxes of O<sub>2</sub>, TCO<sub>2</sub>, DIN, as well as sediment profiles of organic matter, chlorophyll *a*, TCO<sub>2</sub> and DIN were determined. The pattern of the annual oxygen-uptake cycle was largely explained by temperature in all three stations. Among the stations, the highest oxygen-uptake rates were found at the inner station, which showed the highest abundance of microphytobenthos. However, the overall carbon mineralisation was higher in the middle station, which is characterised by the highest biomass of *P. oceanica* detritus in the sediment and the highest abundance of *C. tyrrhena*. The above results are discussed in combination with data from laboratory experiments and measurements of the burrow wall properties.