



Use of a reduced-gravity model to evaluate present and past primary productivity in the tropical open ocean

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ABSTRACT: Upwelling predicted by a reduced-gravity model is compared with remotely sensed primary productivity data through the tropical Atlantic and Pacific. The model upper layer thickness, an indicator of vertical motion, is correlated with primary productivity. We suggest that the Atlantic basin is more efficient than the Pacific in its production for the same degree of upwelling. This is a characteristic of the tropical Pacific ecological provinces being featured by low salinity in the western tropics and high nutrient, but low chlorophyll in the eastern equatorial region. A comprehensive relationship between model upper layer thickness and primary productivity is established through the tropical basins, with emphasis on the equatorial strip. Our work has implications for the application of reduced-gravity models to estimate productivity in palaeocean studies.

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