



Primary productivity in the transitional zone of the Mexican Pacific: inference of organic carbon in the last 5.5 kyr

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INTRODUCTION

The transitional zone of the Mexican Pacific is a complex region in terms of its oceanographic and climatologic conditions. This leads to changes in primary and exported productivity over various time scales. These changes can be inferred by analyzing and quantifying geochemical tracers that have been preserved in the sedimentary record. biogeochemical tracers like organic carbon are widely use to know the variability of oceanographic and climatologic conditions in the past. Specifically, the late Holocene and the late part of the middle Holocene (ca. 5500 years before present) were characterized by periods of warming and cooling, such as the Medieval Warming or Little Ice Age, respectively.

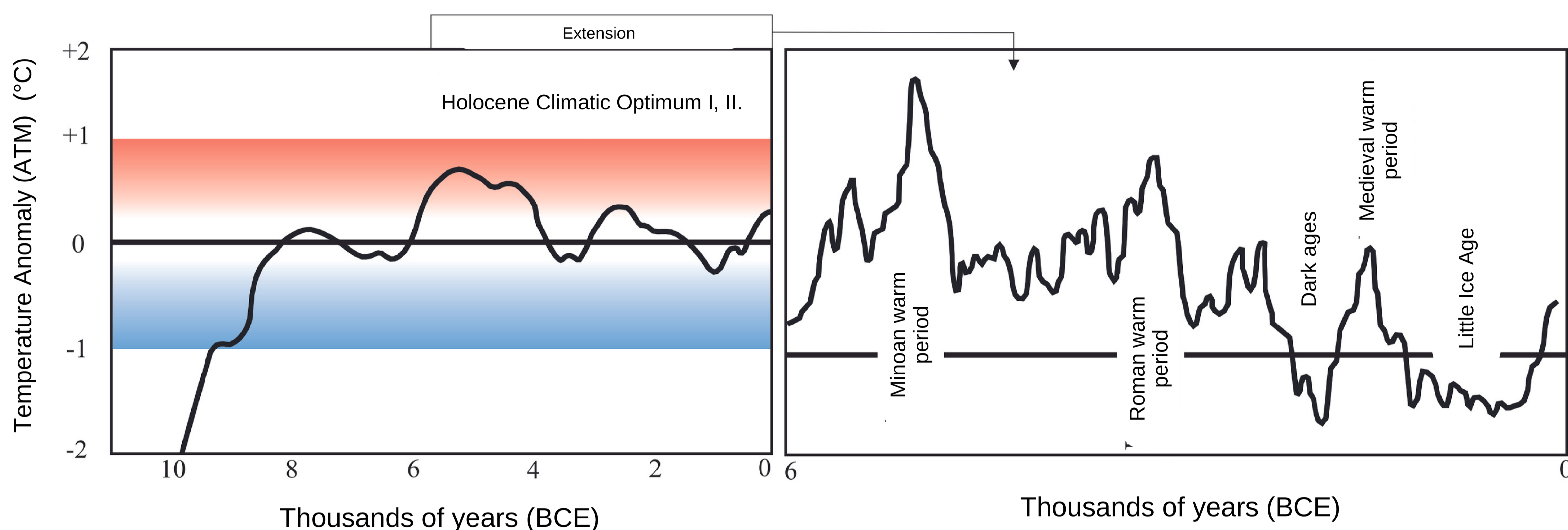


Figure 1. Diagram of the average global atmospheric temperature anomaly over the last 10,000 years.

STUDY SITE

the southwestern margin of Baja California Sur is located on the transicional zone of the mexican Pacific. The current system in this zone is known for the california current which flows towards the Ecuador, the norecuatorial current towards west-noreast and the california countercurrent flowing to the north pole. The california current transports colder, more oxigenated, less saline and more nutrient rich water from the subartic mass. while the california countercurrent transport properties from the ecuatorial subsuperficial mass, which is warmer, saltier and less oxigenated.

MATERIAL AND METHODS

The sediment core was collected at a depth of 680 m in the southwestern margin of Baja California Sur. with a length of 137 cm an was sectioned every 1 cm. The organic carbon content was quantified using a costech 410 elemental analyzer.

RESULTS

The organic carbon content varied from 8 to 14%. Over the last 5500 years, organic carbon values showed decreases in the Dark Age Cold Period (1700 to 1100 years) and in the 4200-year event and increased in the medieval warm period (900 to 1000 years). This suggests that primary and exported productivity responds to oceanographic conditions over various time scales.

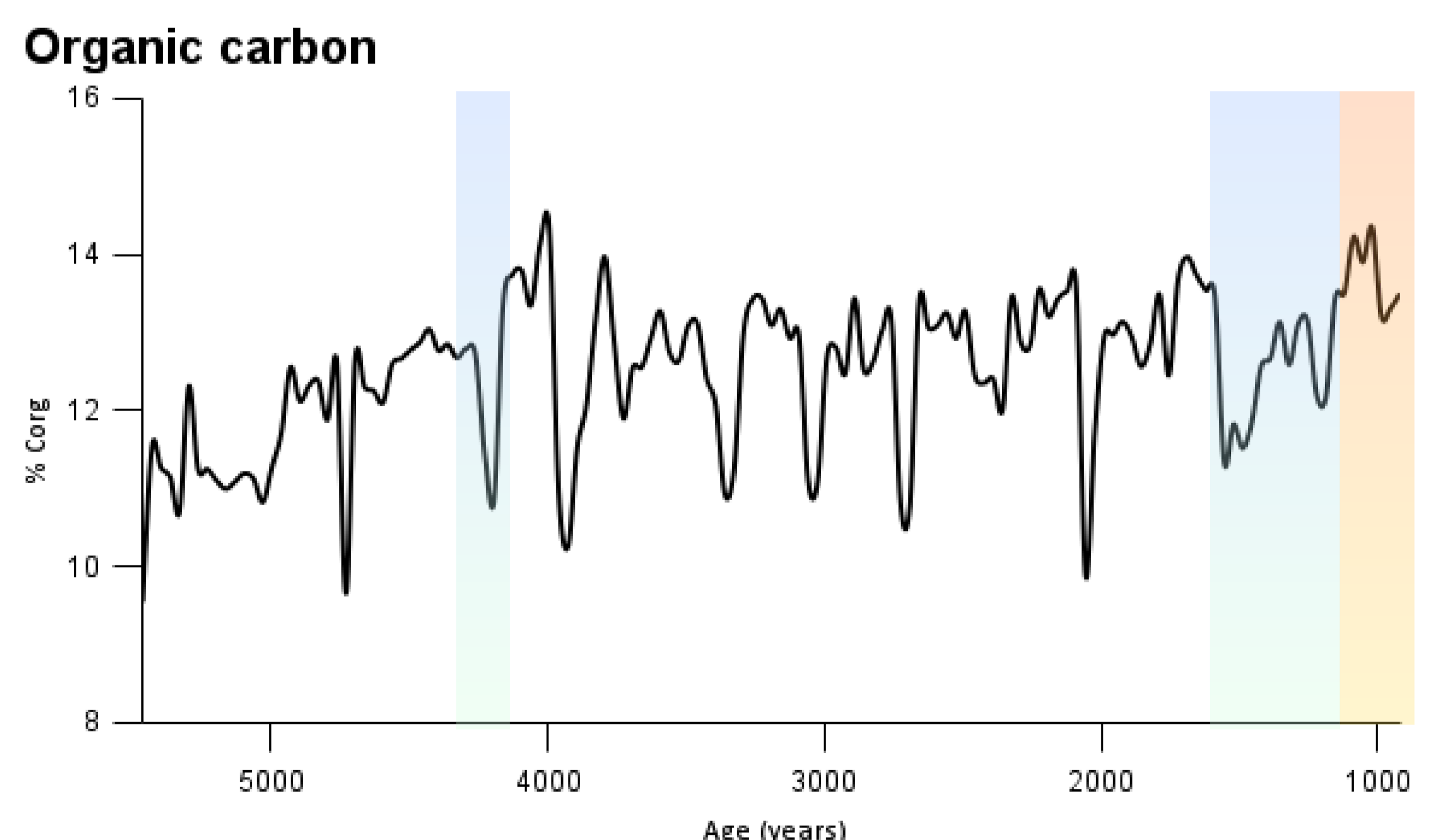


Figure 2. Percentage of organic carbon over the last 5500 years