

# 2000 years of marine primary productivity in the Eastern Tropical North Pacific

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## Motivations

Changes in marine primary productivity (MPP) over the 21st century are expected to occur under the prevailing climate change scenario which urges us to have a better knowledge of past marine productivity and its temporal variability

Identify all the possible significant changes in marine productivity in the context of climate change related to the human activity

## Methods

- **Soledad Basin** is located in the Eastern Tropical North Pacific, on the Mexican continental shelf off Southern Baja California, 50 km off the coast (Fig. 1). This basin is influenced by the California Current System

- **Age model** was build using the software Bacon v4.1.2 (Blaauw and Christen, 2011) applying a combined approach of  $^{210}\text{Pb}$  chronology and  $^{14}\text{C}$  radiocarbon ages on planktonic foraminifera and bulk organic matter

- **TOC (%)** was determined by acid treatment of freeze-dried sediment samples and analyzed in an Elemental analyzer Thermo Fisher Flash 2000HT with a precision better than  $\pm 0.3\%$ .

## Modes of variability

Organic carbon preservation in marine sediments in Soledad Basin reproduce the production and export of marine organic carbon in the water column

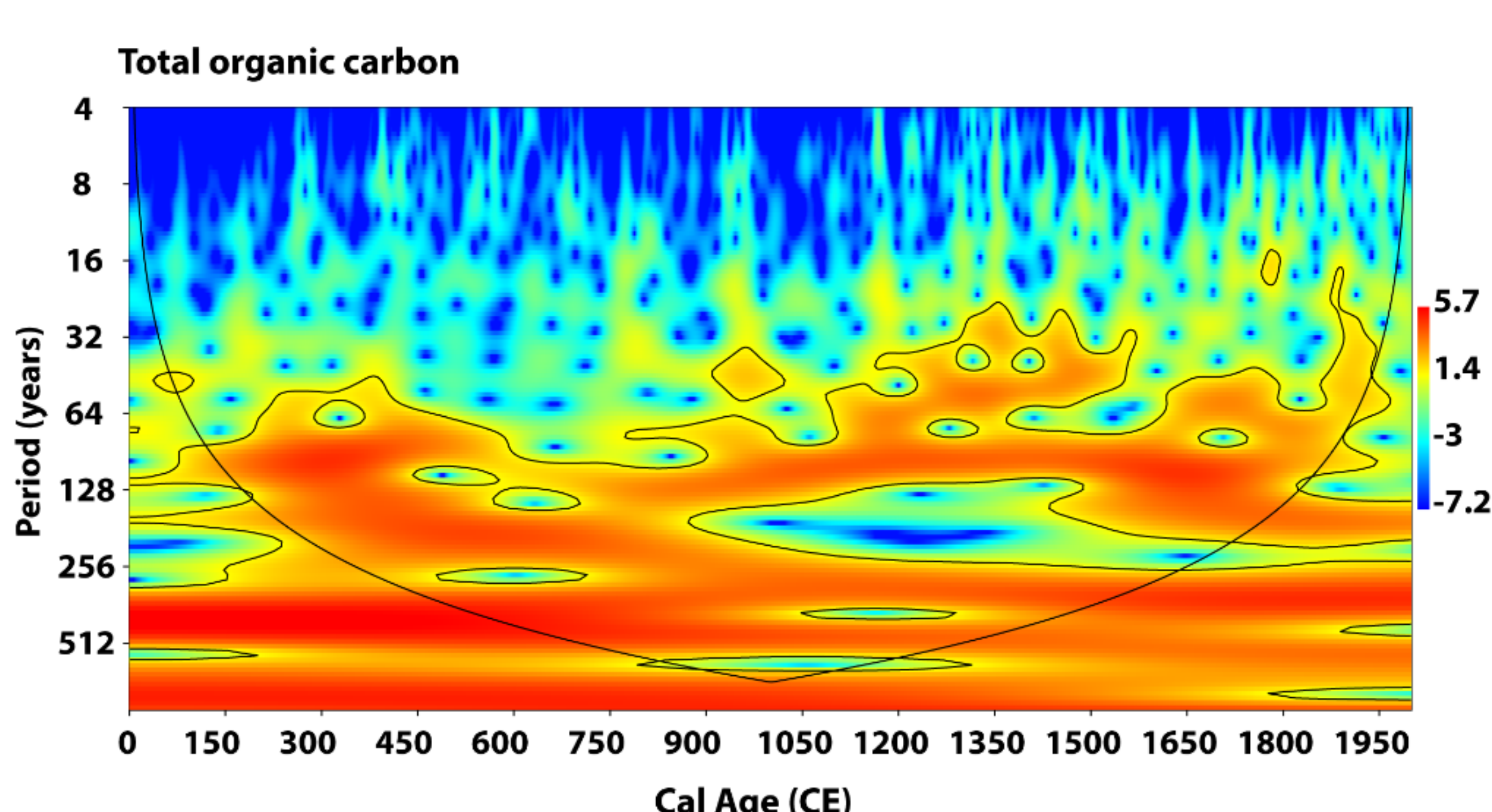


Fig. 3) Wavelet power spectrum for TOC; Contour indicates significance level of  $p=0.05$ . Cone of influence is marked with black curve.

Multi decadal to multi centennial are the most prominent cycles;  
Multi decadal cycles in TOC might be related to **Pacific Decadal Oscillation**

Steady **centennial to multi centennial** cycles during past 2000 years

## Highlights

Total organic carbon is used as a tool to reconstruct marine productivity in Soledad Basin

Prominent multi decadal to multi centennial cycles in marine primary productivity for the past 2000 years. Multi decadal cycle are more significant from 1000 yr (CE) towards the present

Main drivers of centennial- multi centennial cycles in marine primary productivity in this region are unclear

