



Paleohydrology record of the stromatolites of the Bacalar Lagoon: new insight for climate change assessment in the Mexican Caribbean



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Objectives

Determine the changes in the composition and Bacalar Lagoon dynamic through the time

Analysis of **sedimentary record of the stromatolites** in order to know the changes in temperature and precipitation (climate change), and the groundwater contribution

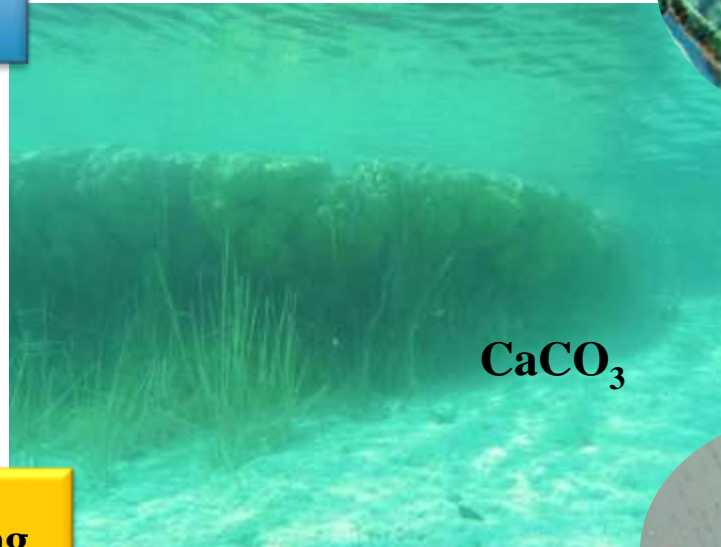
Characterize the **present** physic-chemical conditions of the water related to stromatolites growth

Stromatolites

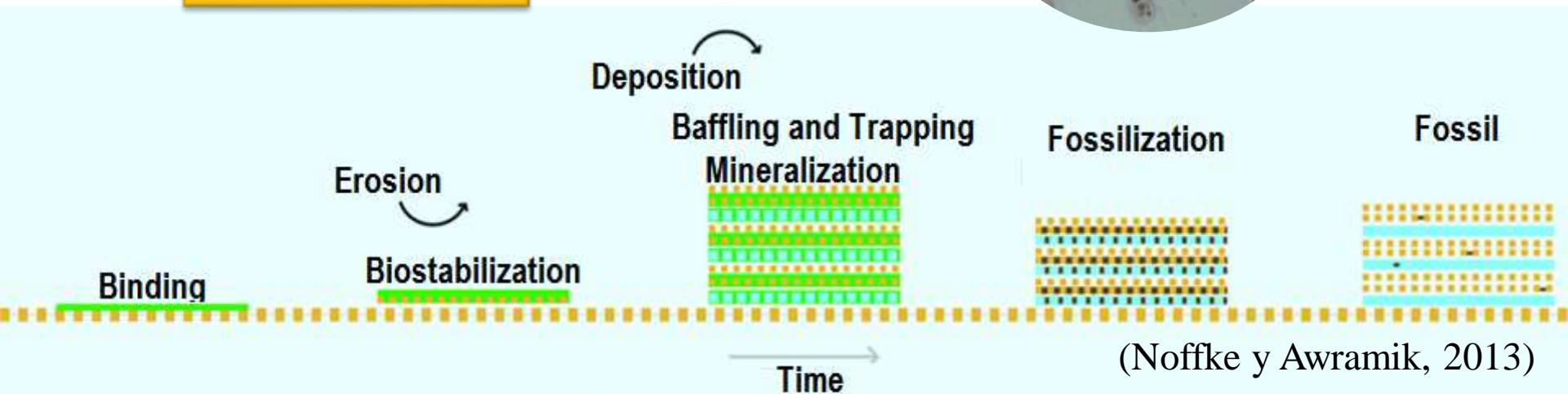
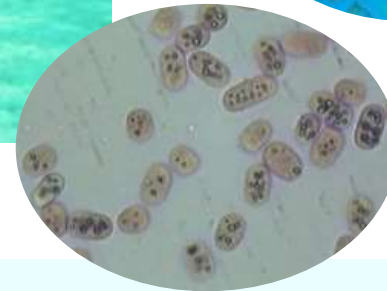
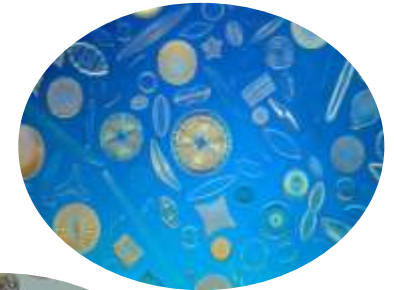
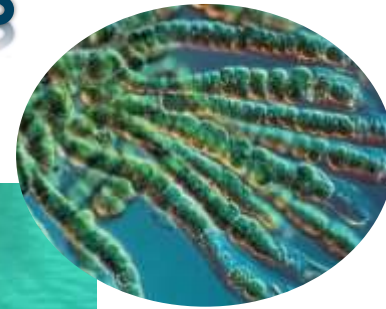
Cyanobacteria

Purple sulfur bacteria

Sulfate reducing bacteria

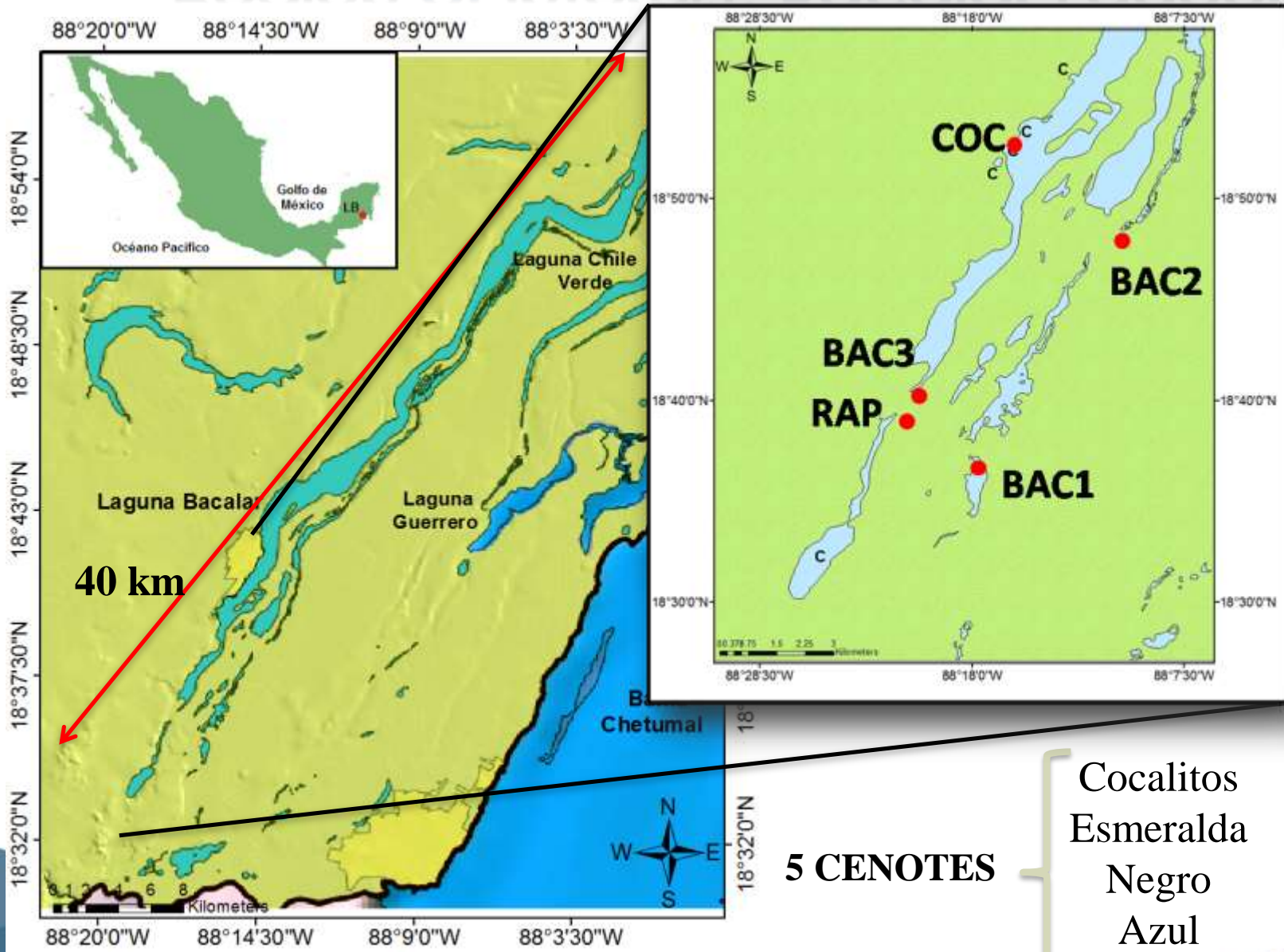


CaCO₃



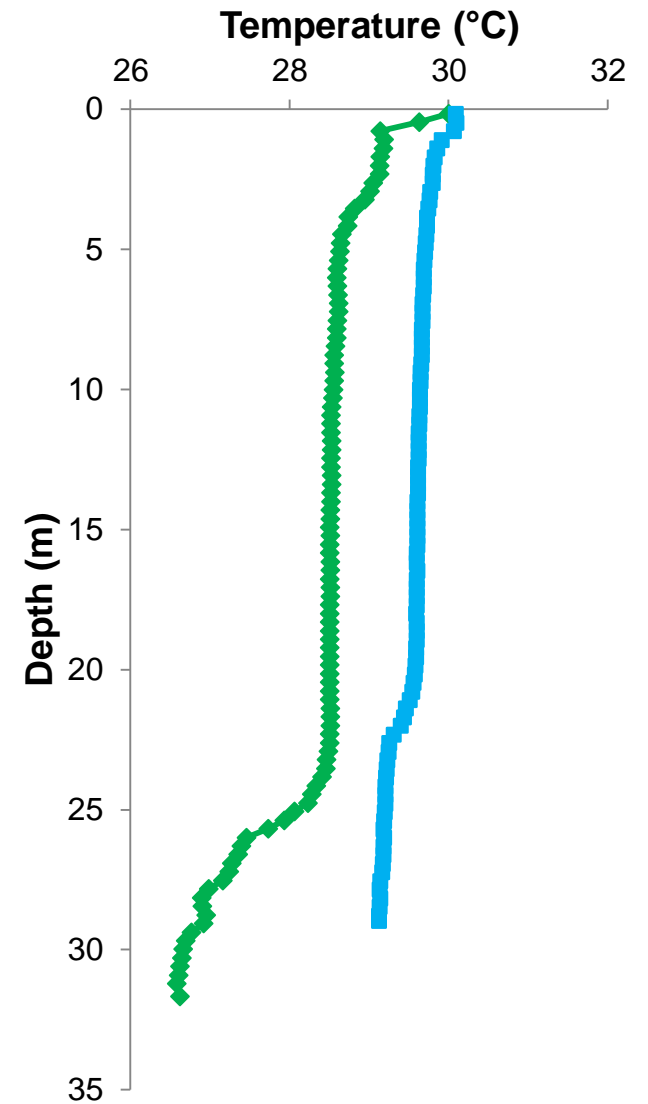
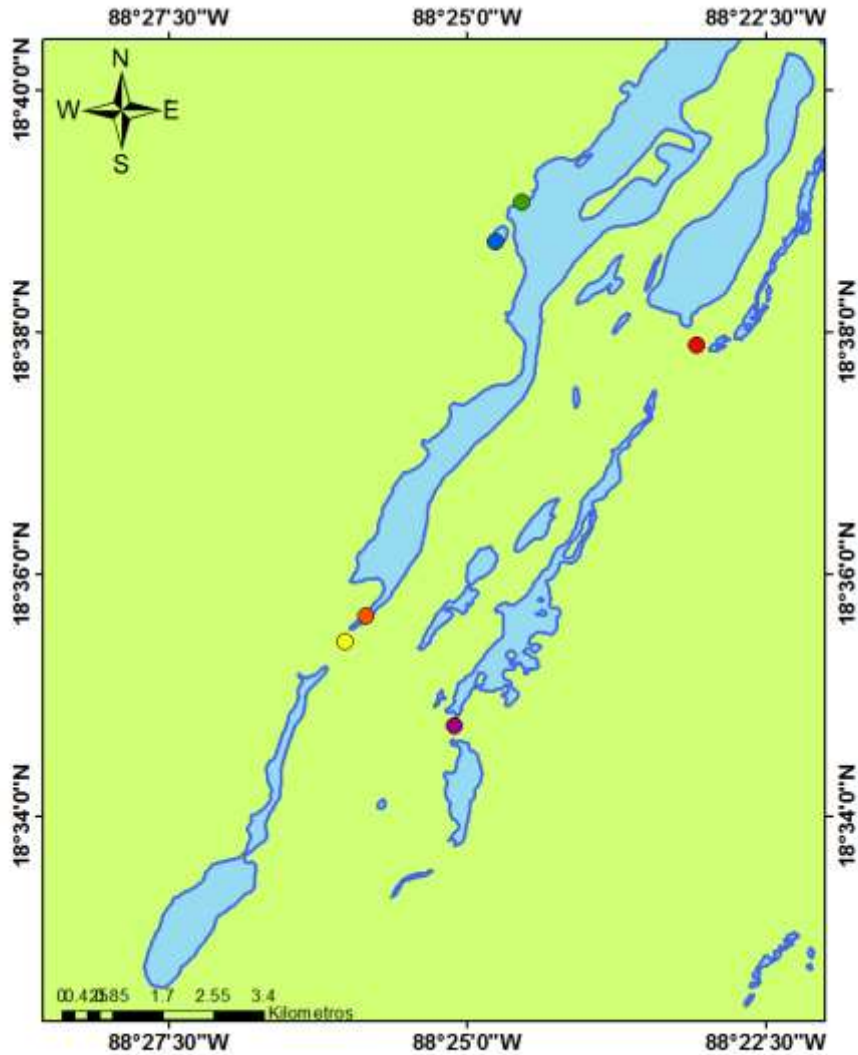
(Noffke y Awramik, 2013)

Region of interest: Bacalar Lagoon



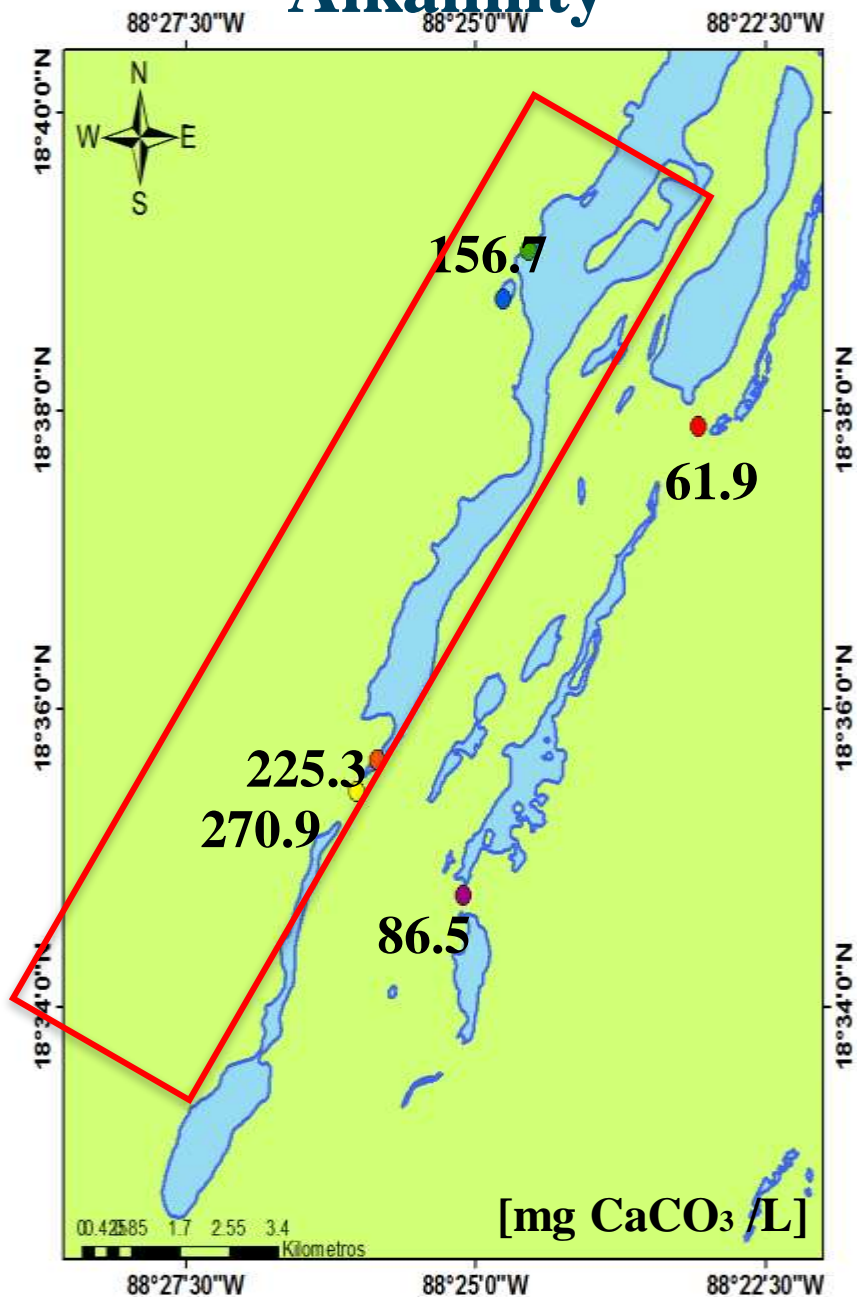
5 CENOTES

- Cocalitos
- Esmeralda
- Negro
- Azul
- Xul-Ha

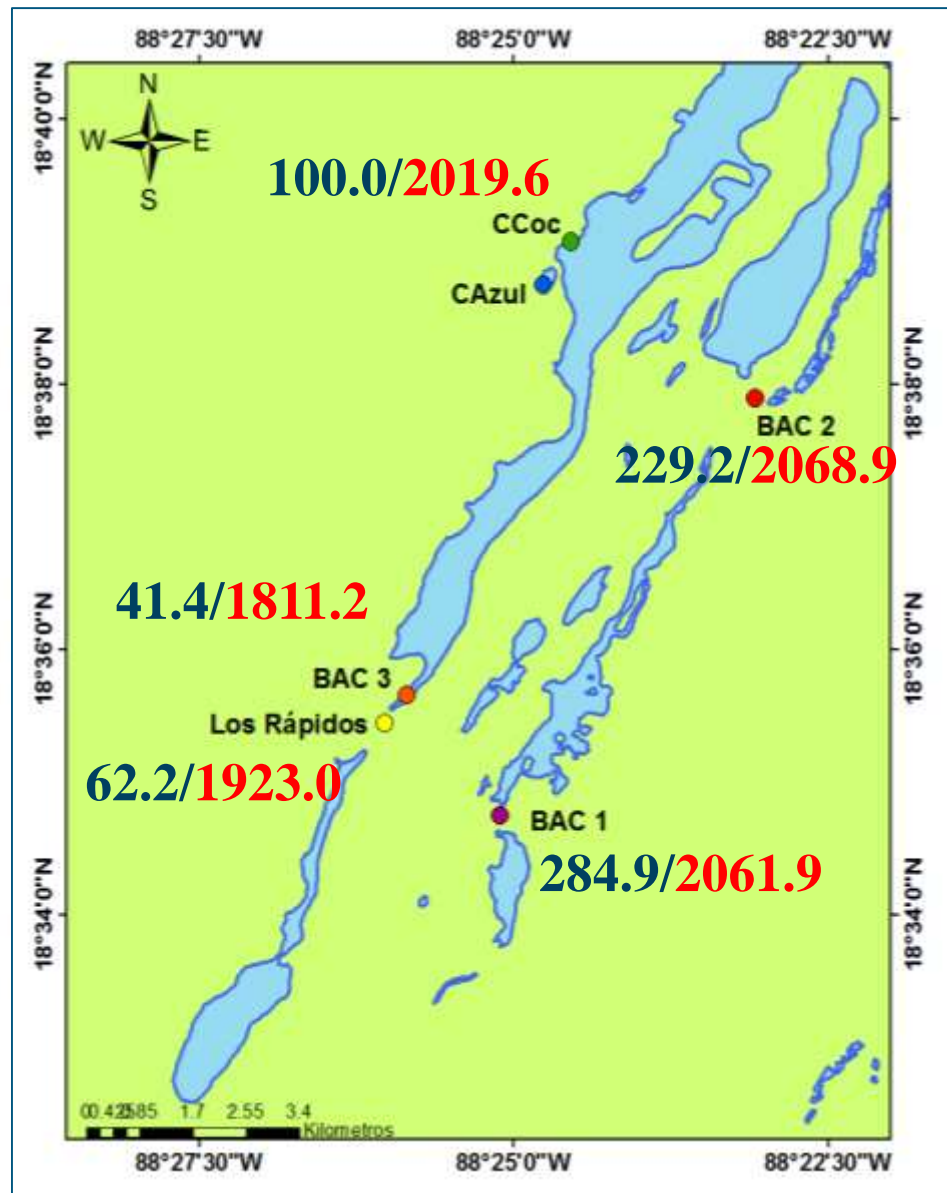


pH 6.6 - 7.3

Alkalinity



Chlorides/Sulfates

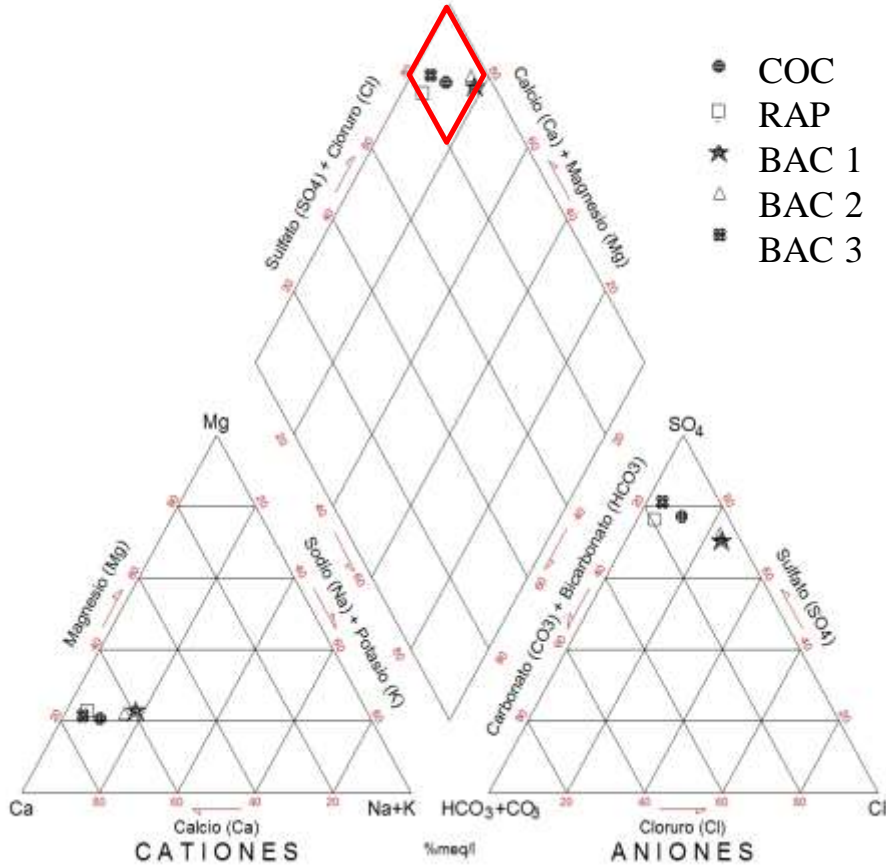


Average seawater: HCO₃⁻: 140 mg/L

Cl⁻ = 19370 mg/L

SO₄²⁻ = 2780 mg/L

Piper Diagram



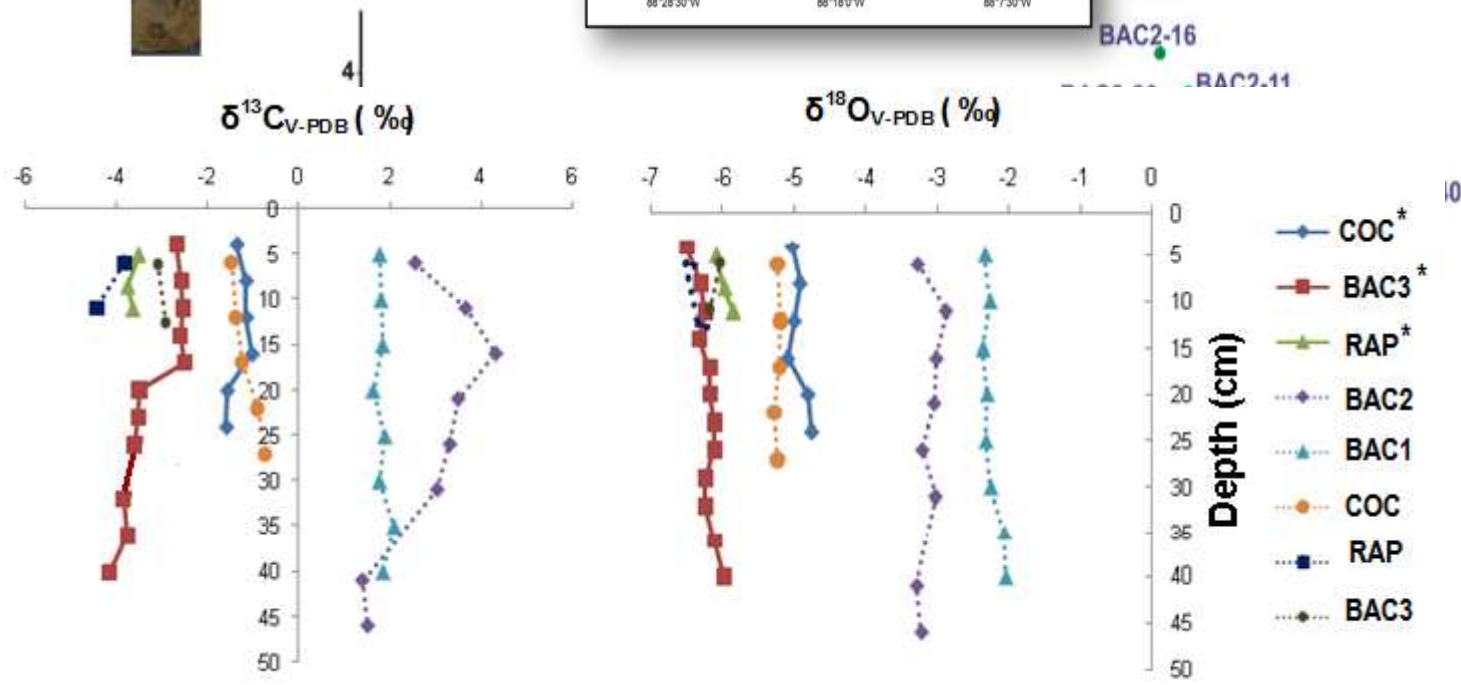
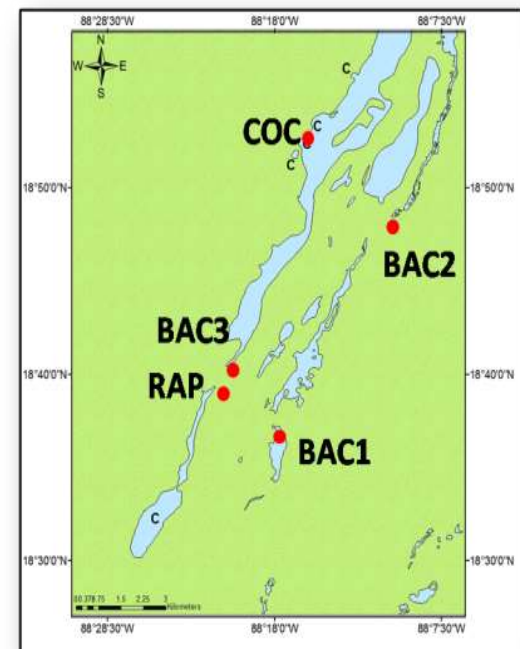
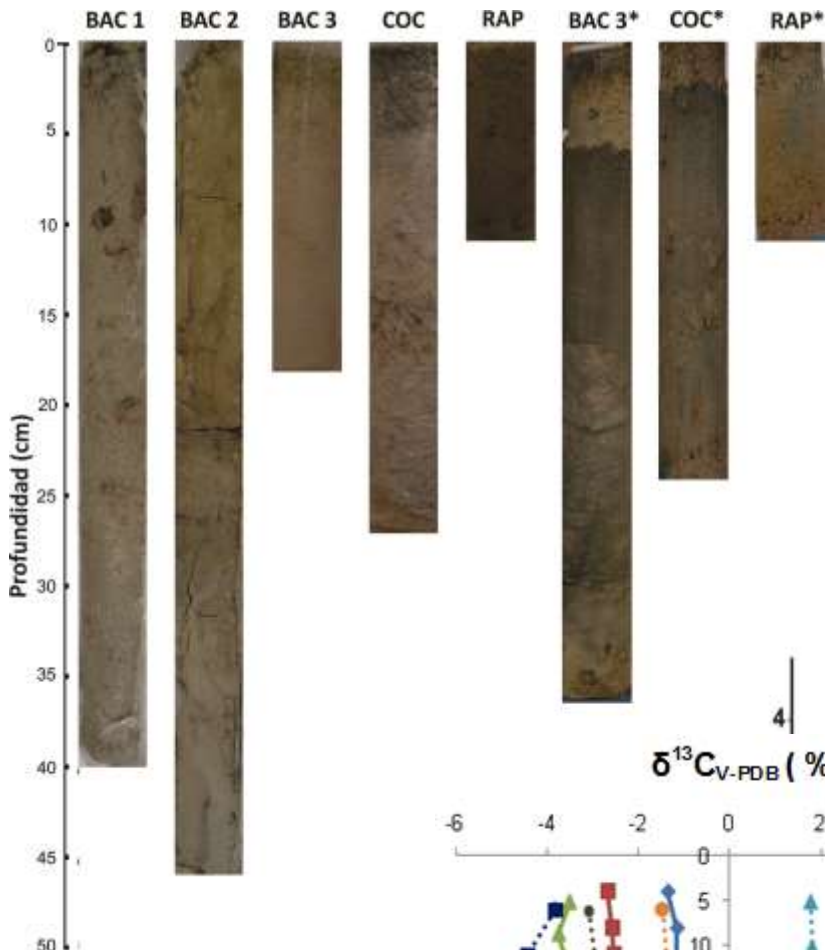
Water Type → Ca-SO₄

Oligotrophic

Homogeneous

High alkalinity → stromatolites

No seawater intrusion



➤ Trace Metals

➤ Fossil record of organisms (diatoms, ostracodes)

¡Thank you!

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