The timing of the rise of the Isthmus of Panama: Inferences from qualitative and quantitative data

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The gradual closure of the Central American Seaway (CAS) severed the exchange between the Equatorial Pacific and the Caribbean, profoundly influencing oceanic circulation and sedimentation rates, causing biological reorganization and triggering the onset of northern hemisphere glaciation.

In the early Miocene to the early Pliocene, the Panama seaway was an interoceanic exchange route. For the middle Miocene, free mixing of water masses for depths greater than 1000-2000m was inferred by the similarity of the Caribbean and the Pacific benthic foraminiferal assemblages from Ecuador. However, Colombian benthic foraminiferal assemblages document a late middle Miocene barrier. But by middle Pliocene all Caribbean - Pacific straits were closed. Thus, the closure of the Panama Seaway severed the exchange between the Equatorial Pacific and the Caribbean, profoundly influencing oceanic circulation, sedimentation rates and to an extent the prevailing climatic conditions, thereby causing major biological reorganization. Such large, physical barriers have been known to greatly affect the temperature and salinity of the water masses and subsequently the evolution of the marine taxa.

This observation forms the basis of the proposed presentation which will attempt to analyze studied benthic foraminiferal samples from ODP sites 999 encompassing the late Miocene – middle Pliocene time interval.

The presentation will try analyzing – Does the inferred qualitative data corroborates the quantitative conclusions?

Hence the presentation will discuss and analyze in brief, the results of:

1. **Qualitative analysis:** which will be based on the inferred paleoecology of the benthic foraminiferal assemblages recorded from the study site – ODP Site 999 between 3-6Myr.

2. **Quantitative analysis:** based on statistical methods to infer measures of diversity