

## **Paleogene and Neogene Caribbean and South American seep communities**

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The Caribbean and Northern South American regions have a rich fossil record of seep communities from the Paleogene (66-23 million years ago) and Neogene (23-2.5 million years ago) time periods. Most of these date to a time when deep water connections between the Atlantic and Pacific Oceans existed through the Central American Seaway. Connections became severed by gradual development of the Isthmus of Panama beginning around 10 million years ago. The Caribbean seep communities from Cuba, the Dominican Republic, Barbados and Trinidad range in age from the Eocene to the Pliocene. The South American examples from Columbia, Venezuela, Peru and Ecuador are Oligocene to Miocene in age. Although there are some faunal similarities between the fossil seeps and those from modern seeps in the Gulf of Mexico, the Caribbean and the Pacific and Atlantic sides of Central America, there are also many fossil taxa that are absent from these modern sites. These include large elongate lucinids (e.g. *Elongatolucina* and *Elliptiolucina*), large globular lucinids (e.g. *Meganodontia* and *Cubatea*), vesicomysids (*Pleurophopsis*), large thick-shelled bivalves superficially resembling vesicomysids, and tall abyssochrysoid gastropods (e.g. *Hokkaidoconcha*, *Ascheria* and *Humptulipsia*). These gastropods have origins in Mesozoic seeps and are now extinct; some bivalves, such as *Meganodontia* and the large elongate lucinids, are now only found only in the central Indo-Pacific Ocean; other bivalves were endemic and are now also extinct. These differences show there was considerable biogeographic interchange between the seep faunas of the Pacific and the Caribbean region prior to the closure of the Isthmus of Panama.