

The geology of the Fogo seamounts

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The Fogo seamounts are located approximately 500 km offshore Newfoundland and southwest of the Grand Banks. They are early Cretaceous basalts partially buried under slope deposits that mantle a transform fault zone. It is believed that the seamounts formed one of two ways. They may have formed either from the relative movement of the lithosphere over a mantle hot spot or by magma rising along a linear fault zone. The distribution and age of the Fogo seamounts was studied to decide which of these processes was likely responsible for their origin.

The distribution, size, and geometry of the seamounts was determined using bathymetry, magnetics, and seismic reflection profiles. The distribution of the seamounts shows that there is no clear linear trend; instead a broad zone of

volcanism is seen across the transform margin. Flat tops of seamounts indicate marine erosion once volcanic activity stopped, followed by subsidence as the oceanic lithosphere cooled. The flat tops show a complex pattern but are generally deeper to the NW, suggesting greater time for subsidence in that direction. This is supported by biostratigraphic and radiometric data from wells and a dredge sample taken from the area as the seamounts appear to go decrease in age from NW to SE.

These data support the idea that the seamounts originated from magma that was caused by a plume that moved relative to the lithosphere. Reactivated faults then channelled this magma upward, making the Fogo seamounts different from typical seamount chains.